SERVICE MANUAL

BE-2A CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.
KX-1410QM	RM-841	AEP	SCC-G04-AA

MODEL	COMMANDER	DEST.	CHASSIS NO.
KX-2110QM	RM-841	AEP	SCC-G04-BA

MICROFILM

TRINITRON® COLOR TV

SONY®

SPECIFICATIONS

[KX-1410QM]

Picture tube	Black Trinitron tube Approx. 36 cm [14 inches] (Approx. 33.7 cm picture measured diagonally) 90° degree deflection

[KX-2110QM]

Picture tube	HI-Black Trinitron tube Approx. 55 cm [21 inches] (Approx. 51 cm picture measured diagonally) 100° degree deflection
Inputs	21-pin connector: CENELEC standard RGB input. Audio In : Phono jack
Outputs	Headphones jack: minijack BNC connector. Video loop-through output: BNC connector.
Sound output	4W (Music)
Power consumption	45Wh [KX-1410QM] 65Wh [KX-2110QM]
Dimensions	Approx. 359x345x409 mm (w/h/d) [KX-1410QM] Approx. 513x487x475 mm (w/h/d) [KX-2110QM]
Weight	Approx. 10.5 kg [KX-1410QM] Approx. 24kg [KX-2110QM]

[RM-841]

Remote control system infrared control

Power requirements	1.5V dc 1 battery IEC designation R6 (size AA)
Dimensions	Approx. 48x200.5x18 mm (w/h/d)
Weight	Approx. 100g including batteries
Supplied accessories	RM-841 Remote Commander (1) IEC designation R6 battery (1)

Design and specifications are subject to change without notice.

TABLE OF CONTENTS

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVAL OF THE ANODE CAP.

WARNING !!

AN ISOLATING TRANSFORMER SHOULD BE USED DURING ANY SERVICE WORK TO AVOID POSSIBLE SHOCK HAZARD, DUE TO A LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARKED WITH ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

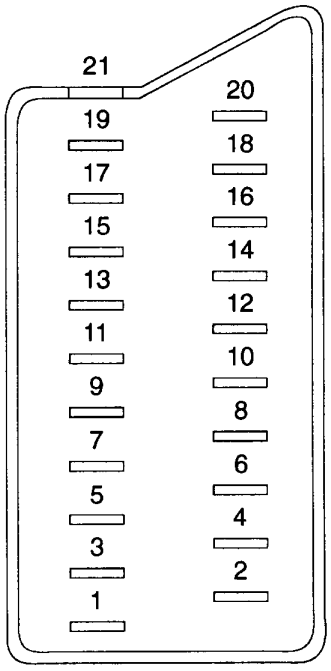
ATTENTION !!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHASSIS SOUS TÉNSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISE LORS DE TOUT DEPANNAGE.
LE CHÁSSIS DE CE RECÉPTEUR EST DIRECTEMENT RACCORDÉ Á L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPSANTS RELATIFS A LA SÉCURITÉ. !!

LES COMPOSANTS IDENTIFÈS PAR UNE TRAME ET PAR UNE MARQUE ⚠ SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REM-PLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLIMÉNTS PUBLIÉS PAR SONY.

1-1. 21 PIN CONNECTOR

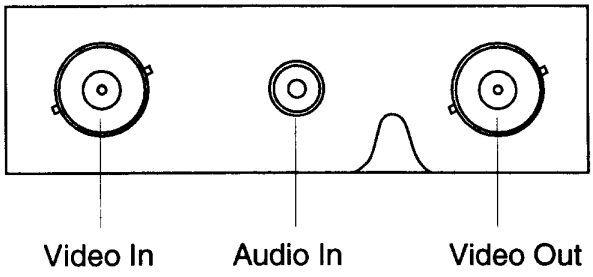


21 pin connector (1 ⊖)

Pin No		Signal	Signal level
1	●	Open	
2	○	Audio input	Standard level:0.5Vrms Input impedance:More than 10kohms*
3	●	Open	
4	○	Ground (audio)	
5	○	Ground (blue)	
6	○	Audio input	Standard level:0.5Vrms Input impedance:More than 10kohms*
7	○	Blue input	0.7V±3dB, 75ohms, positive
8	●	Open	
9	○	Ground (green)	
10	●	Open	
11	○	Green	Green signal:0.7V±3dB. 75ohms, positive
12	●	Open	
13	○	Ground(red)	
14	○	Ground (blanking)	
15	○	Red input	0.7V±3dB, 75ohms, positive
16	○	Blanking input (Ys signal)	High state (1—3V) Low state (0—0.4V) Input impedance:75ohms
17	○	Ground (video output)	
18	○	Ground (video input)	
19	●	Open	
20	○	Video input	1V±3dB, 75ohms, positive Sync:0.3V(–3, +10dB)
21	○	Common ground (plug, shield)	

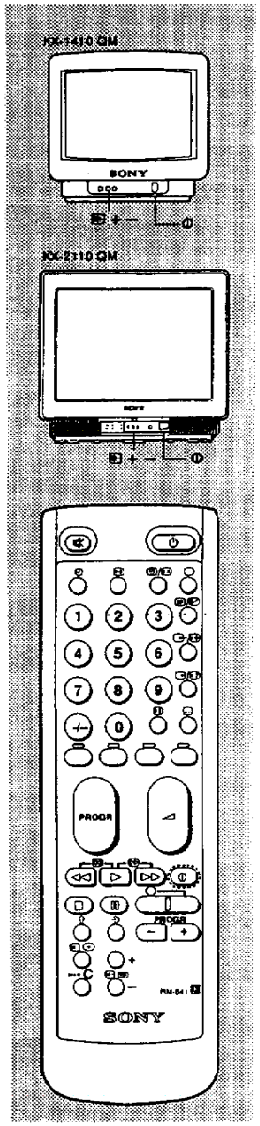
○ connected ● unconnected (open) * At 20 Hz—20kHz

REAR SOCKETS



Video input	1V±3dB, 75ohms, positive Sync:0.3V(–3, +10dB)
Audio input	Standard level:0.5Vrms Input impedance:More than 10kohms
Video Output	1V±3dB, 75ohms, positive Sync:0.3V(–3, +10dB)

1-2. Basic Monitor Operation



This section introduces you to he basic control functions which are available on the Monitor and on the Remote Commander.

How to turn the monitor on and off

Action	Result
Turning on	
Press the power switch ⏻ on the set.	The monitor will turn on. **Note:** If the screen remains blank, the monitor may be in the standby mode. In this case press ▢.
Turning off	
A Temporarily	
Press ⏻.	The monitor is now in standby mode. Press ▢ or any number button to return to monitor mode.
B Completely	
Press the power switch ⏻.	The monitor will turn off.

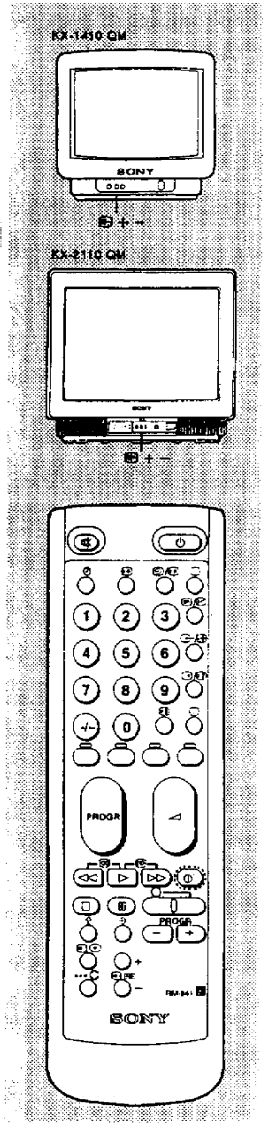
How to adjust the volume

Action	Result
Press ◿ + or −.	The volume markers will appear and the volume is adjusted accordingly.

On the set:
Press ⊜ until the ◿ symbol is displayed, then adjust with the +/− buttons.

1-3. Advanced monitor operation

Instructions shown here are partial excerpts from the Instruction Manual.
The pages of the Instruction Manual are included here in their original state.



This section introduces you to the advanced control functions which are available on the Remote Commander.

How to adjust the picture

Although the picture has been adjusted at the factory, you might want to adjust it to your own taste. For modifications please follow the steps:

Action	Result
1 Press button ⊜ repeatedly, until the desired item is displayed (◑ contrast, ◕ colour intensity, ☼ brightness, ◹ hue).	The symbol and the level indicator for the selected item is displayed.
2 Press button + or −.	The picture item is adjusted.

On the set:
Press button ⊜ repeatedly in order to select the desired item, then adjust with button + or −.

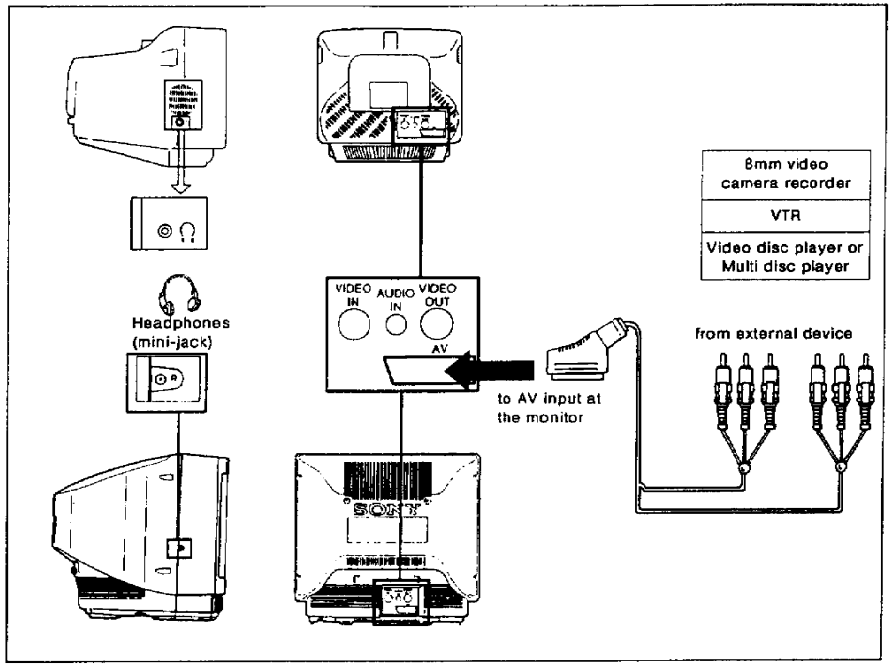
To return to factory set levels:
Press the →← button.

Other functions

How to	Action	To resume normal picture/sound
Display the input mode.	Press ⊡.	Press ⊡ again.
Mute the sound.	Press 🔇.	Press 🔇 again.

1-4. Optional connections/operations

How to connect additional Audio/video equipment



How to view the Video input signal

The monitor has input mode for audio/video signals and RGB signals via the 21-pin Euro connector or audio/video signals via the connectors at the rear.

Note

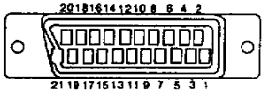
- When you have Audio/video equipment connected to both the A/V connectors and the 21-pin terminal, make sure that both are not switched on at the same time, otherwise the picture could be incomplete.
- In case of sound and picture distortions move the VTR away from the monitor.

1-5. Additional information

Specifications

	KX-1410 QM	KX-2110 QM
Colour system	PAL, SECAM, NTSC 3.58/4.43	
Picture tube	BLACK TRINITRON	HI-BLACK TRINITRON
	approx. 36cm (14 inches) (approx 33.7cm Picture measured diagonally) 90° deflection	approx 55 cm (21 inches) (approx 51cm Picture measured diagonally) 100° deflection
Inputs	21-pin connector: CENELEC standard RGB input VIDEO IN: BNC connector 1vp-p sync negative AUDIO IN: Phono jack 500 mV rms	
Outputs	Headphones Jack: minijack BNC connector 75Ω terminated video loop-through output: BNC connector 75Ω terminated	
Sound ouput	4W (music)	
Power consumption	45Wh	65Wh
Dimensions (w/h/d)	Approx. 359 x 345 x 405mm	Approx. 513 x 487 x 475mm
Weight	Approx. 10.5kg	Approx. 24kg
Supplied accessories	RM-841 Remote Commander (1), IEC designation R6 battery (1)	
Design and specifications are subject to change without notice.		

Pin assignment



AV connector (21-pin)

Pin No.	Signal	Description
1	NC	
2	Audio input B (right)	Standard level: 0.5 Vrms Input impedance: More than 10 k ohms*
3	NC	
4	GND for audio	GND
5	GND for blue input	GND
6	Audio input A (left)	Standard level: 0.5 Vrms Input impedance: More than 10 k ohms*
7	Blue input	0.7 ± 3 dB, 75 ohms
8	NC	

Pin No.	Signal	Description
9	GND for green input	GND
10	NC	
11	Green input	(Same as Pin 7)
12	NC	
13	GND for red input	GND
14	GND for blanking inout	GND
15	Red input	(Same as Pin 7)
16	Blanking input	High state (1-3 V) Low state (0-0.4 V) Input impedance: 75 ohms
17	GND	GND
18	GND for video input	GND
19	NC	
20	Video input	1 V ± 3 dB, 75 ohms Sync: 0.3 V (± 3 dB)
21	Common GND (plug, shield)	GND

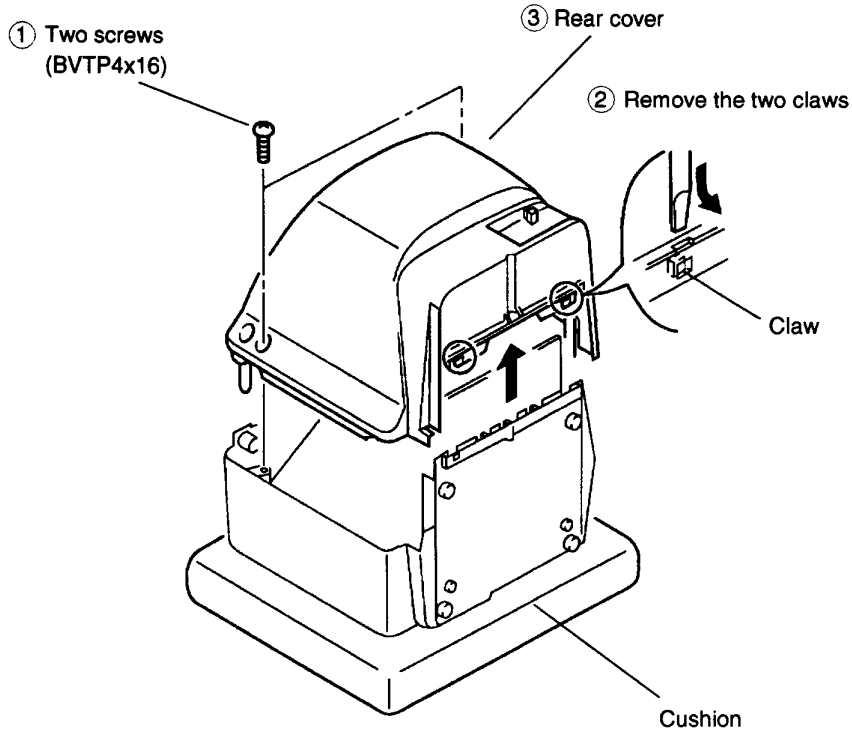
* at 20Hz - 20kHz

Design and specifications subject to change without notice.

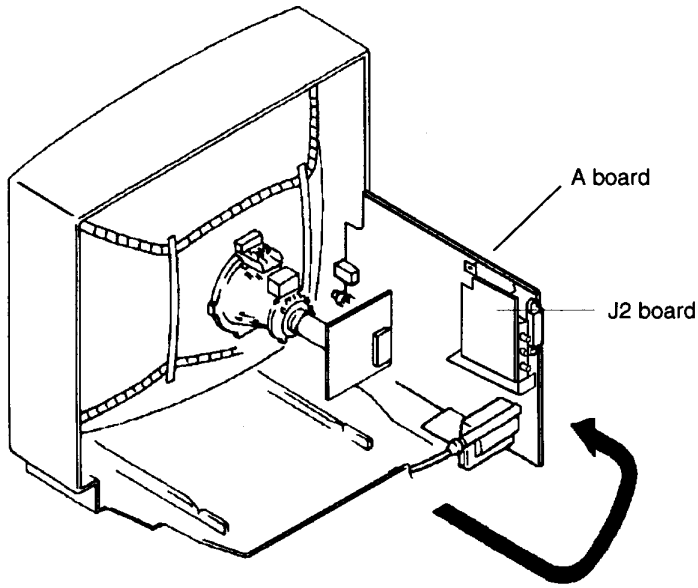
SECTION 2
DISASSEMBLY

[KX-1410QM]

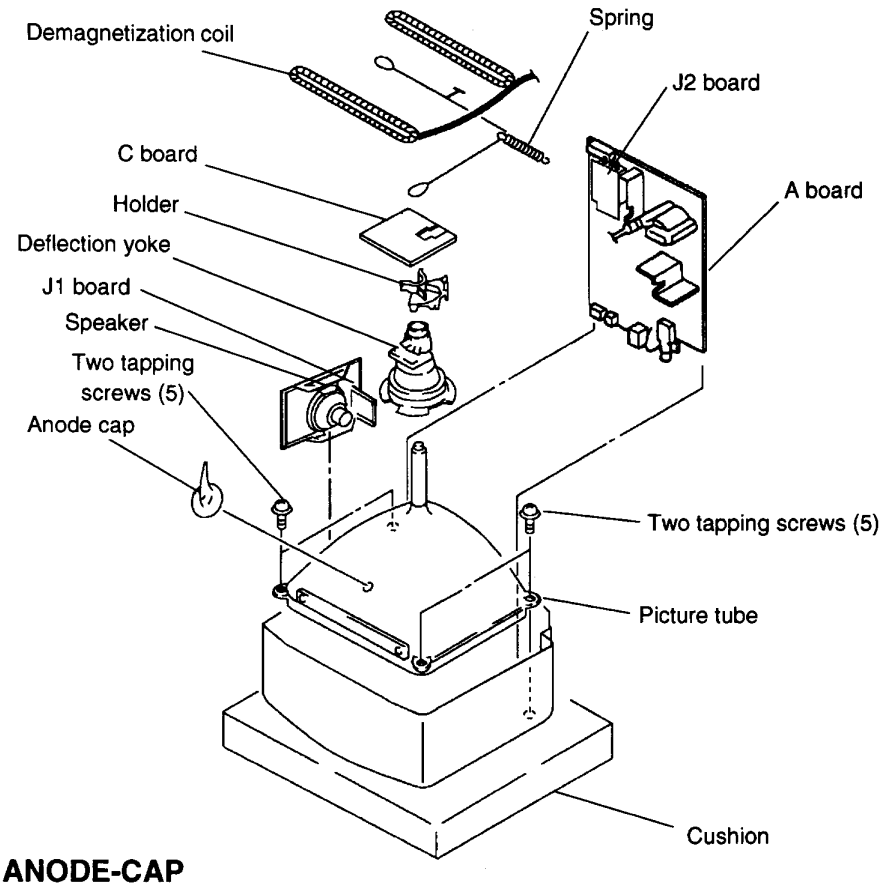
2-1. REAR COVER REMOVAL



2-2 SERVICE POSITION



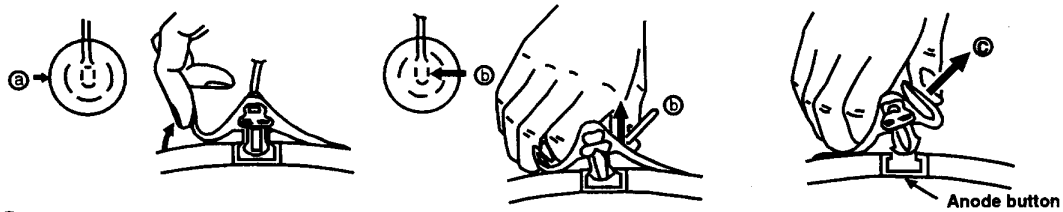
2-3. PICTURE TUBE REMOVAL [KX-1410QM]



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

* **REMOVING PROCEDURES.**



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ

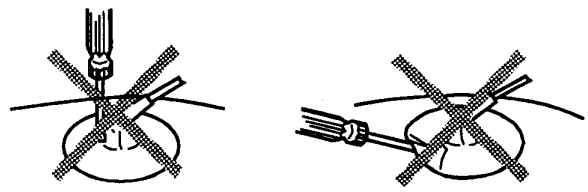
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ

• HOW TO HANDLE AN ANODE-CAP

① Don't damage the surface of anode-cap with sharp shaped material !

② Don't press the rubber hardly not to hurt inside of anode-caps !
A metal fitting called as shatter-hook terminal is built into the rubber.

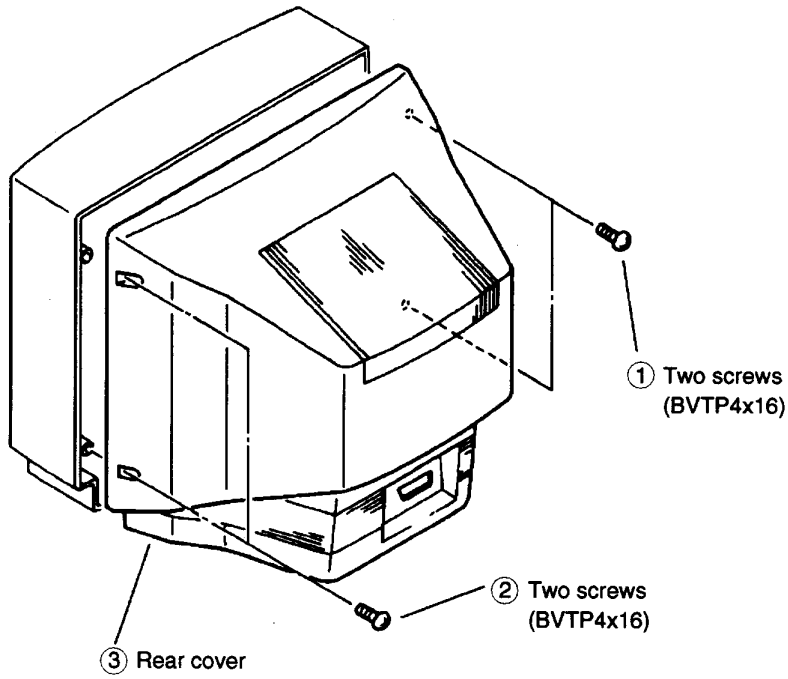
③ Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



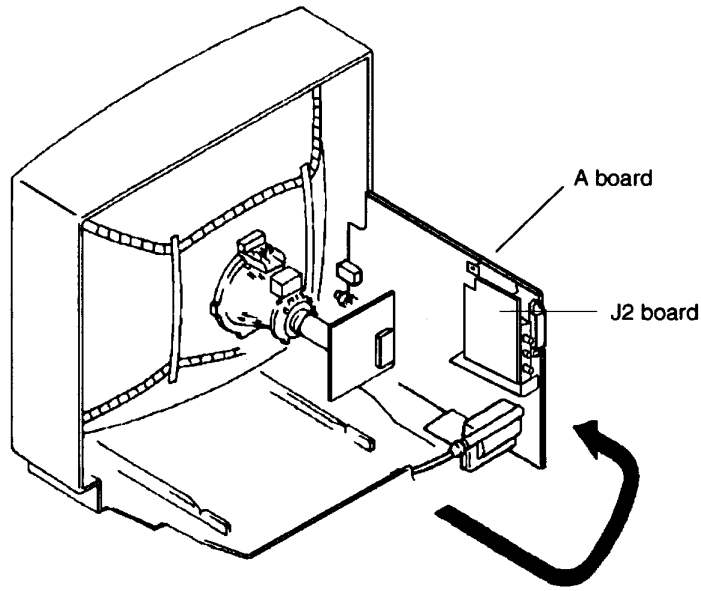
SECTION 2
DISASSEMBLY

[KX-2110QM]

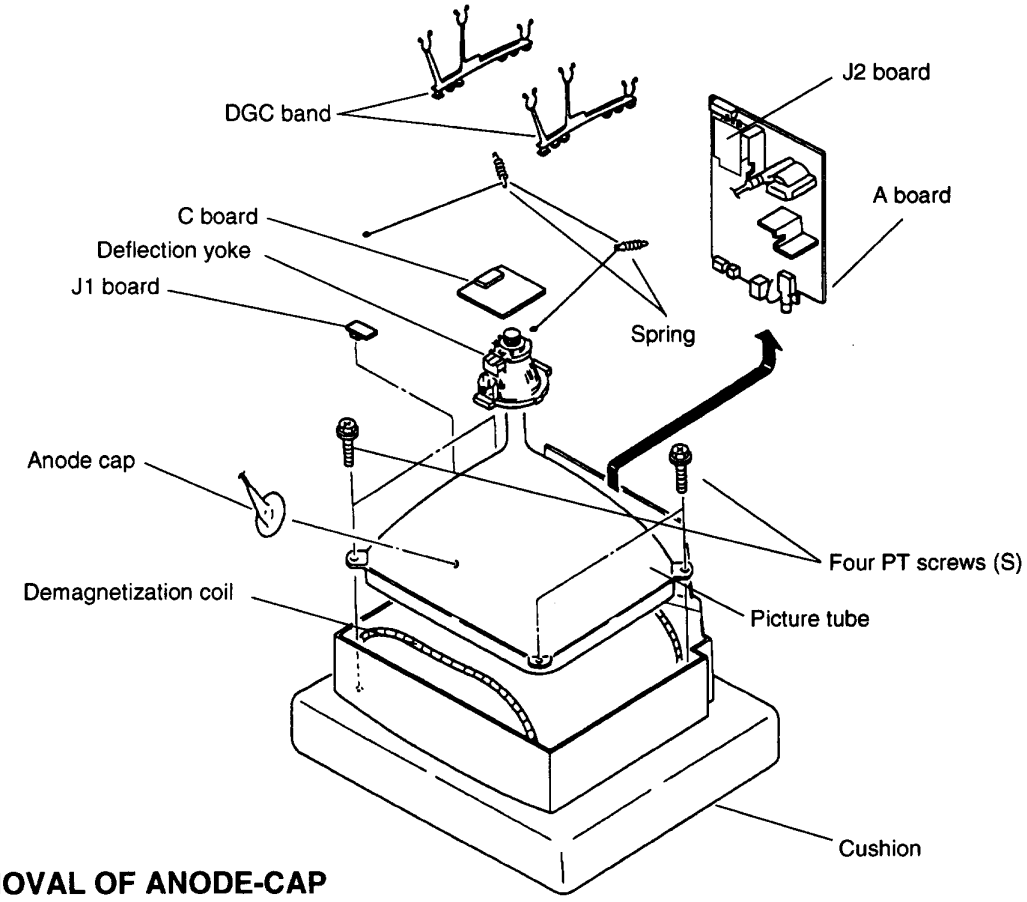
2-4. REAR COVER REMOVAL



2-5 SERVICE POSITION



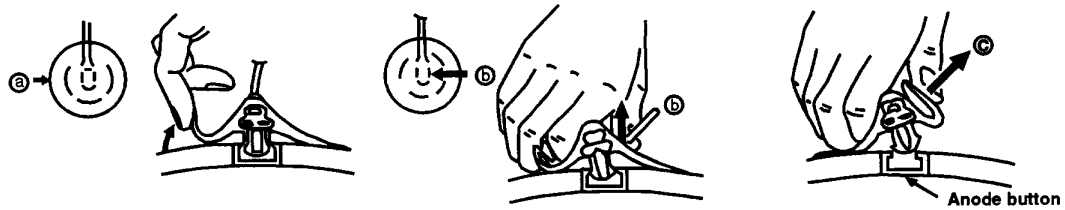
2-6. PICTURE TUBE REMOVAL [KX-2110QM]



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

* **REMOVING PROCEDURES.**



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ

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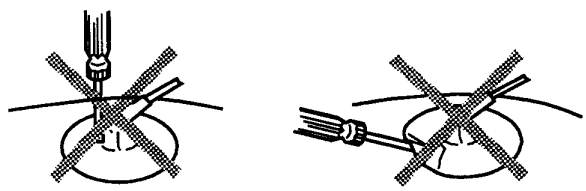


SECTION 3
SET-UP ADJUSTMENTS

[KX-1410QM]

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with rated power supply voltage unless otherwise noted.

The controls and switch below should be set as follows unless otherwise noted:

◑ CONTRAST control 80%
(or Normal by commander)
☼ BRIGHTNESS control 50%

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2) and White Balance

Note: Test Equipment Required.
1. Color bar/Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

Preparation:

- Set the side of the unit with the PICTURE TUBE so that it faces east or west in order to reduce the influence of external magnetic force.
- Turn the power switch for the unit ON and erase the magnetic force using a degausser.

3-1. BEAM LANDING

Demagnetize with a degausser.

1. Input a raster signal with the pattern generator.
   CONTRAST } normal
   BRIGHTNESS }
2. Turn the raster signal of the pattern generator to red.
3. Move the deflection yoke backward, and adjust with the purity control so that red is in the center and blue and green are at the sides evenly.
   (Fig. 3-1 - 3-3)
4. Move the deflection yoke forward, and adjust so that entire screen becomes red. (Fig. 3-1)
5. Switch over the raster signal to blue and blue and confirm the condition.
6. When the position of the deflection yoke is determined, tighten it with a deflection yoke mounting screw.
7. When landing at the corner is not right, adjust by using the disk magnets. (Fig. 3-4)

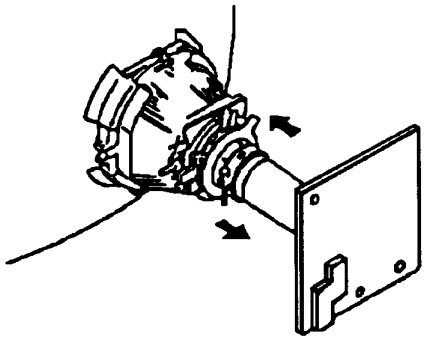


Fig. 3-1

Fig. 3-2

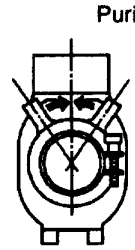


Fig. 3-3

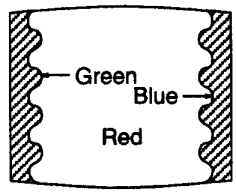
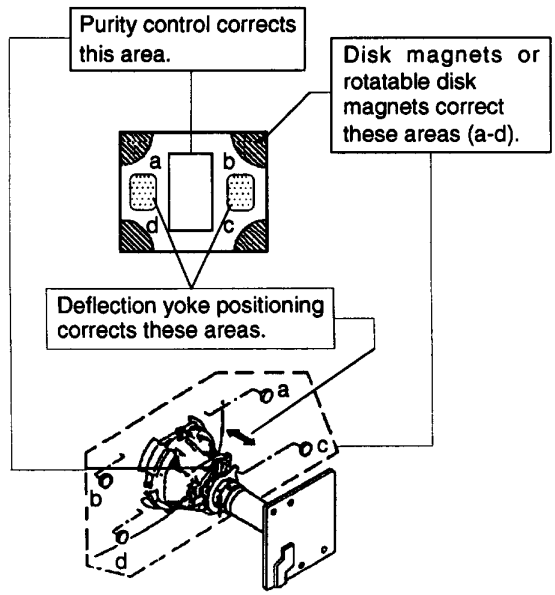


Fig. 3-4

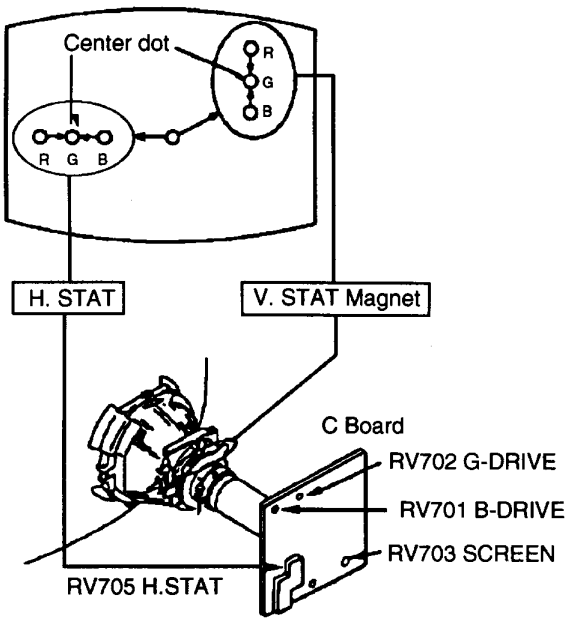


3-2. CONVERGENCE

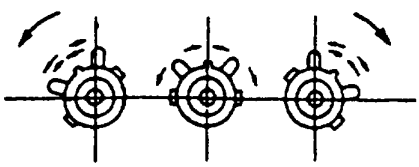
Preparation:

- Before starting, perform FOCUS, H.SIZE, and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Feed in the dot pattern.

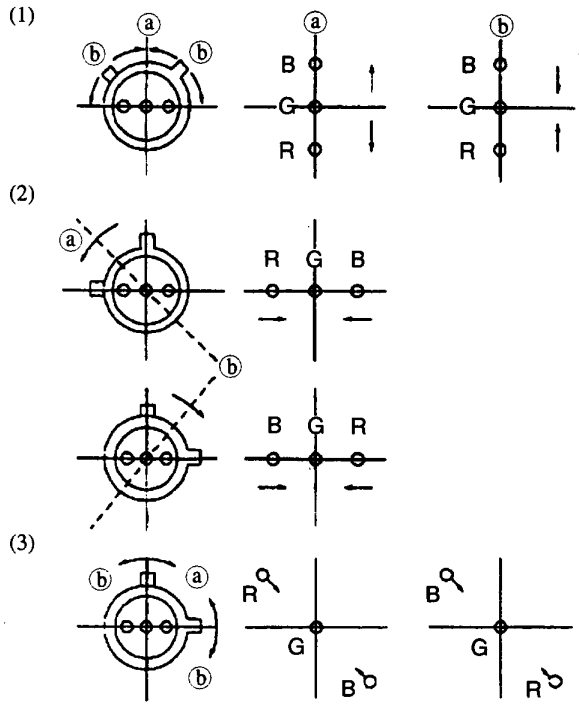
(1) Horizontal and Vertical Static Convergence



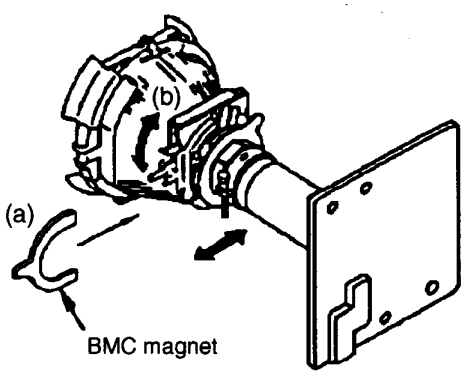
1. Adjust H.STAT VR to converge red, green and blue dots the in center of the screen. (Horizontal movement)
2. Adjust V.STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical movement)
3. If the red, green and blue dots do not converge on the center of screen with H.STAT VR, perform horizontal convergence adjustment using H.STAT VR and V.STAT magnet as shown below. (In this case, H.STAT VR and V.STAT magnet effect each other.)
   - Tilt the V.STAT magnet and adjust static convergence to open or close the V.STAT magnet.



4. When the V.STAT magnet is moved in the direction of arrows ⓐ and ⓑ the, red, green and blue dots move as shown below.



If the red and blue dot do not converge with green dots, perform following steps.
Move BMC magnet (a) to correct insufficient H.static convergence.
Rotate BMC magnet (b) to correct insufficient V.static convergence.
In either case, repeat Beam Landing Adjustment.

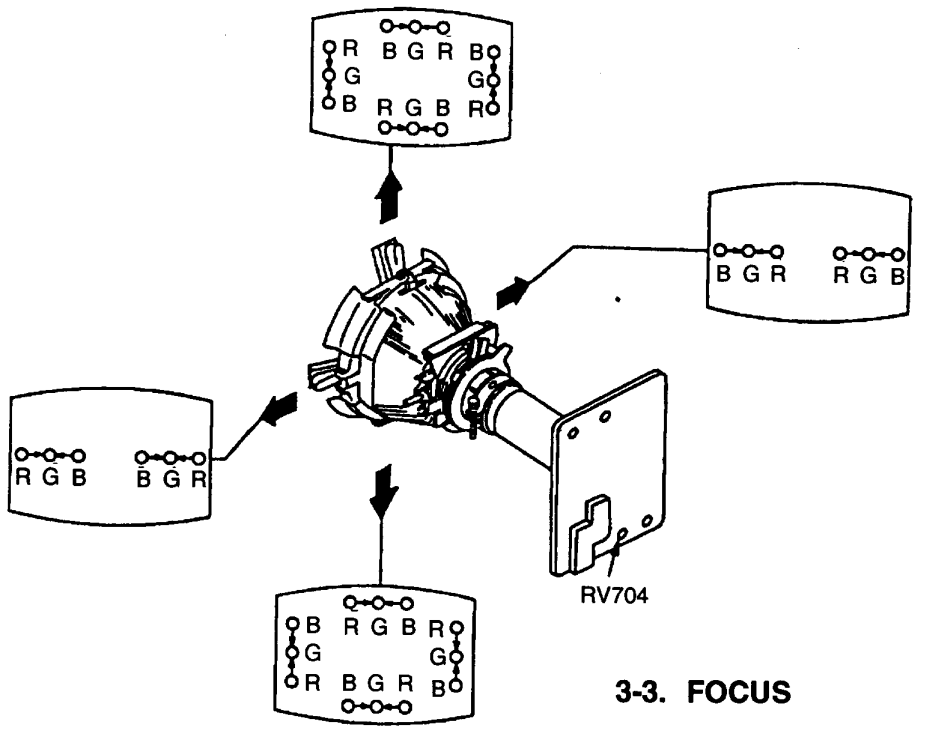


(2) Dynamic Convergence Adjustment

Preparation:

- Before starting perform Horizontal and Vertical static convergence Adjustment.

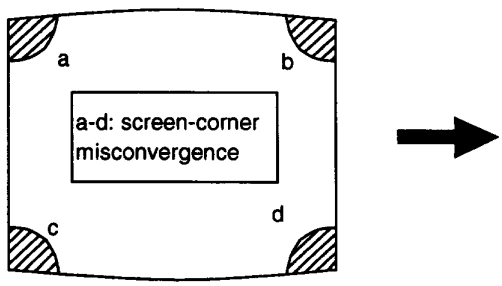
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

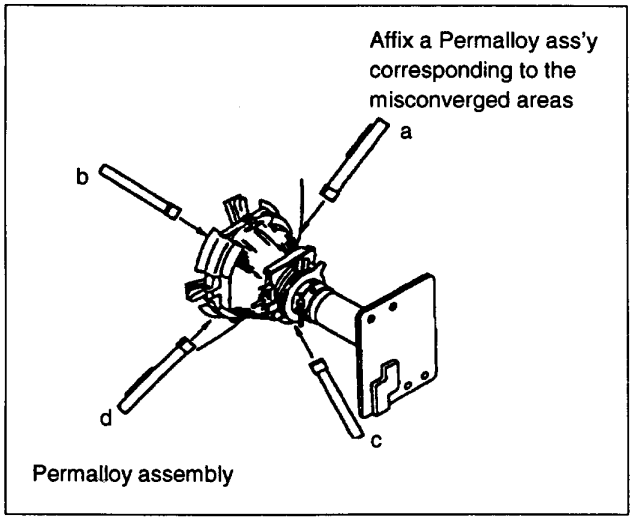


3-3. FOCUS

Adjust FOCUS so that the whole screen is in best focus.

(3) Screen-corner Convergence





SECTION 3
SET-UP ADJUSTMENTS

[KX-2110QM]

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with rated power supply voltage unless otherwise noted.

The controls and switch below should be set as follows unless otherwise noted:

◑ CONTRAST control 80%
(or Normal by commander)
☼ BRIGHTNESS control 50%

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2) and White Balance

Note: Test Equipment Required.
1. Color bar/Pattern Generator
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3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

Preparation:

- Set the side of the unit with the PICTURE TUBE so that it faces east or west in order to reduce the influence of external magnetic force.
- Turn the power switch for the unit ON and erase the magnetic force using a degausser.

3-4. BEAM LANDING

Demagnetize with a degausser.

1. Input a raster signal with the pattern generator.
   CONTRAST } normal
   BRIGHTNESS }
2. Turn the raster signal of the pattern generator to red.
3. Move the deflection yoke backward, and adjust with the purity control so that red is in the center and blue and green are at the sides evenly.
   (Fig. 3-5 - 3-7)
4. Move the deflection yoke forward, and adjust so that entire screen becomes red. (Fig. 3-5)
5. Switch over the raster signal to blue and blue and confirm the condition.
6. When the position of the deflection yoke is determined, tighten it with a deflection yoke mounting screw.
7. When landing at the corner is not right, adjust by using the disk magnets. (Fig. 3-8)

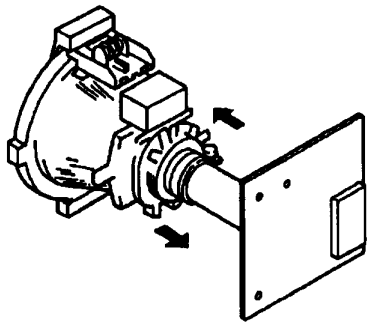


Fig. 3-5

Fig. 3-6

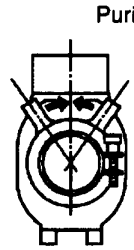


Fig. 3-7

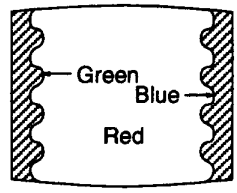
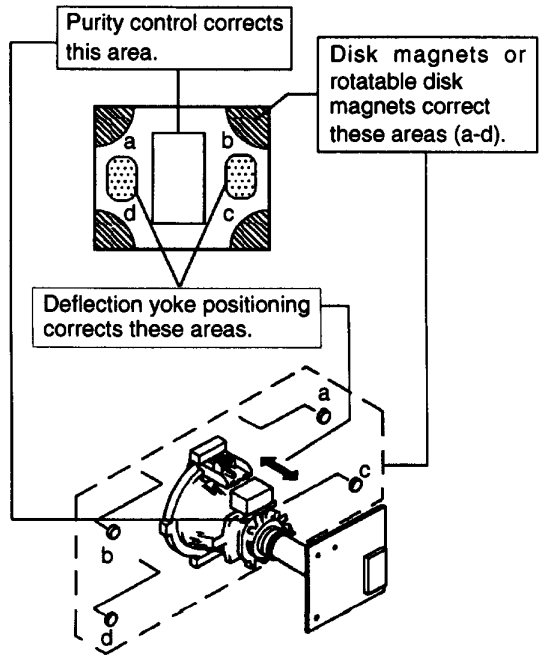


Fig. 3-8

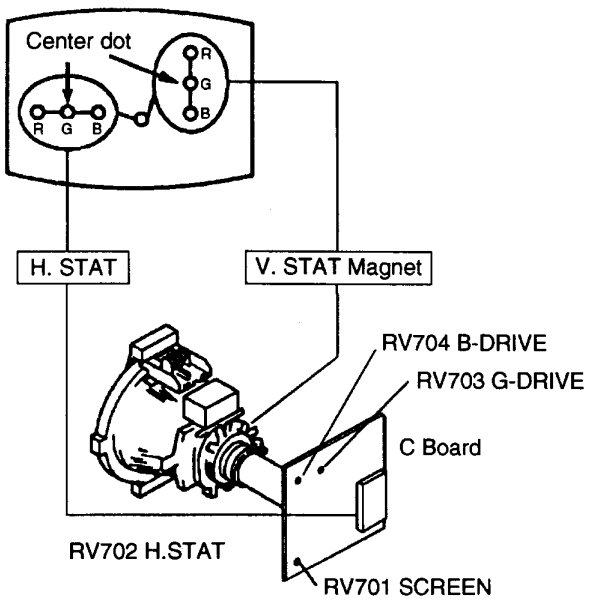


3-5. CONVERGENCE

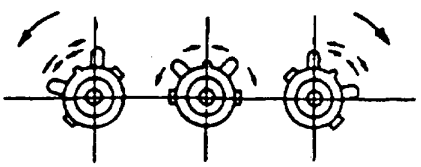
Preparation:

- Before starting, perform FOCUS, H.SIZE, and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Feed in the dot pattern.

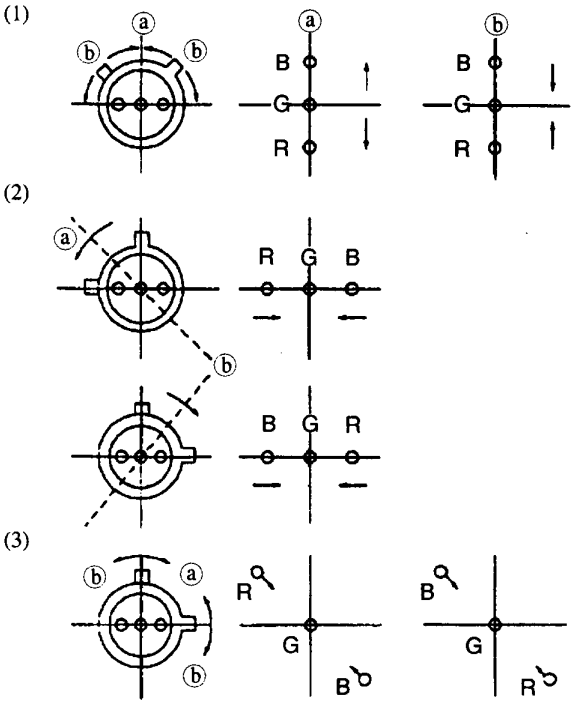
(1) Horizontal and Vertical Static Convergence



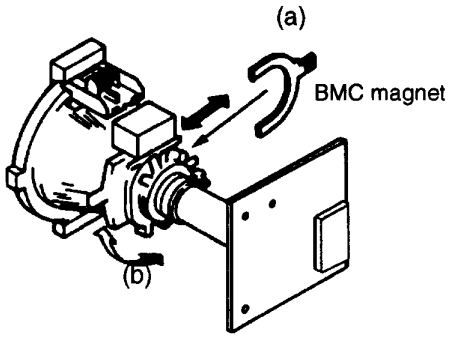
1. Adjust H.STAT VR to converge red, green and blue dots the in center of the screen. (Horizontal movement)
2. Adjust V.STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical movement)
3. If the red, green and blue dots do not converge on the center of screen with H.STAT VR, perform horizontal convergence adjustment using H.STAT VR and V.STAT magnet as shown below. (In this case, H.STAT VR and V.STAT magnet effect each other.)
   - Tilt the V.STAT magnet and adjust static convergence to open or close the V.STAT magnet.



4. When the V.STAT magnet is moved in the direction of arrows ⓐ and ⓑ the, red, green and blue dots move as shown below.



If the red and blue dot do not converge with green dots, perform following steps.
Move BMC magnet (a) to correct insufficient H.static convergence.
Rotate BMC magnet (b) to correct insufficient V.static convergence.
In either case, repeat Beam Landing Adjustment.

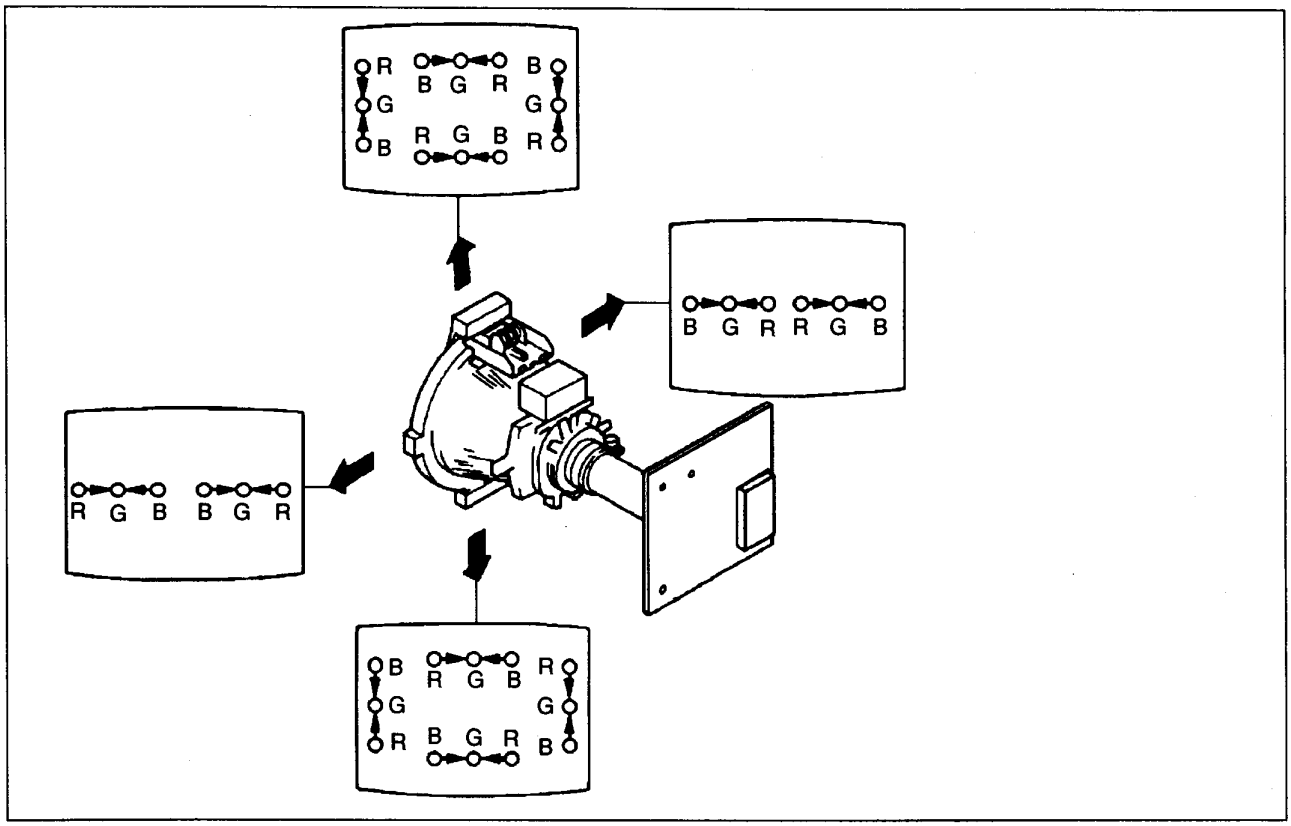


(2) Dynamic Convergence Adjustment

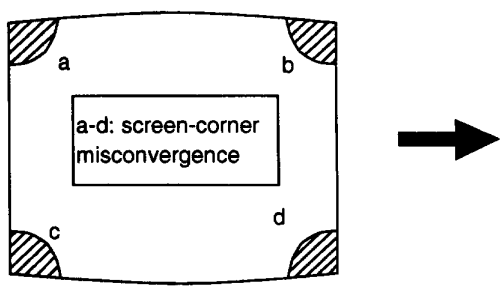
Preparation:

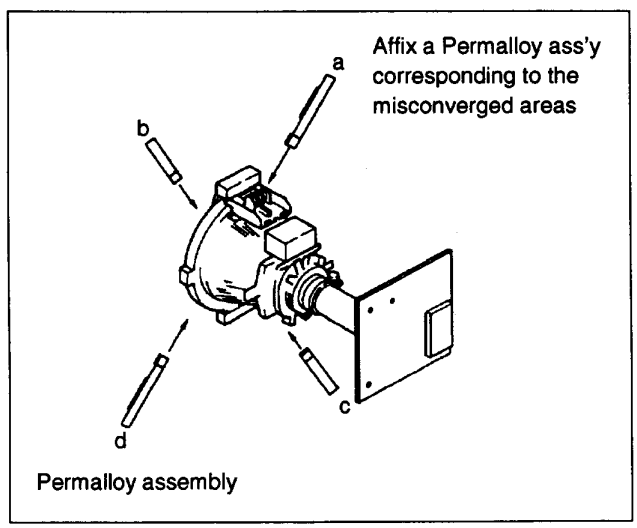
- Before starting perform Horizontal and Vertical static convergence Adjustment.

1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.



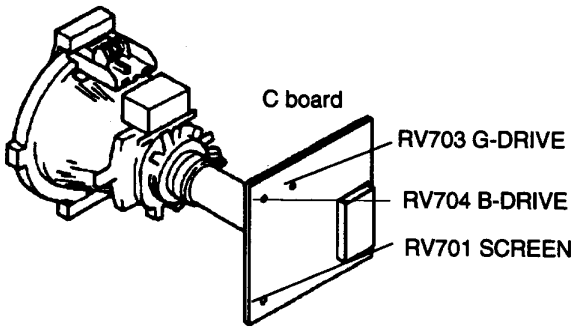
(3) Screen-corner Convergence



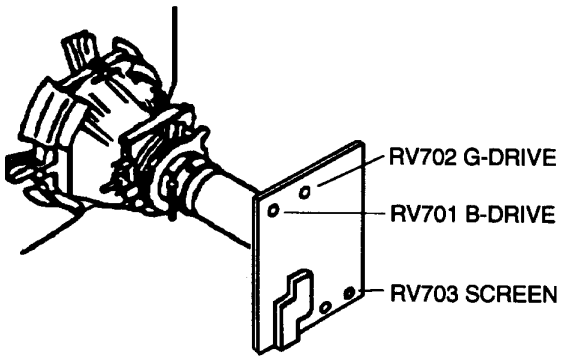


3-6. SCREEN (G2) and WHITE BALANCE

[KX-2110QM]



[KX-1410QM]



Screen (G2) setting

1. Input dot signal from the pattern generator.
2. Set the picture BRIGHTNESS control to minimum level.
3. Apply 140V DC to the cathodes of R, G and B from an external power source.
4. While watching the picture, adjust the G2 volume (RV703 14", RV701 21") immediately before fly-back line disappears.

White Balance Adjustment

1. Input all-white signal from the pattern generator.
2. Adjust the BRIGHTNESS and COLOR controls to the standard level.

[KX-1410QM]

3. Adjust the following using RV701 (B DRIVE) and RV702 (G DRIVE).

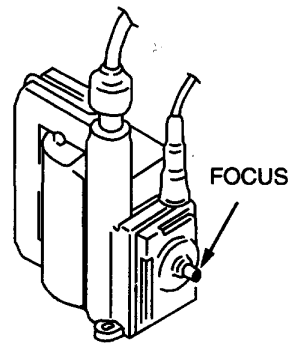
[KX-2110QM]

3. Adjust the following using RV704 (B DRIVE) and RV703 (G DRIVE).

In the following adjustments, the CONTRAST, COLOR and BRIGHTNESS controls are set to normal unless otherwise specified.

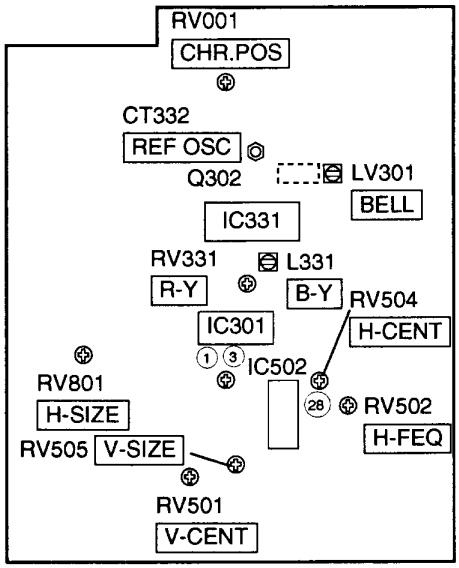
3-7. FOCUS

Adjust FOCUS so that the whole screen is in best focus.



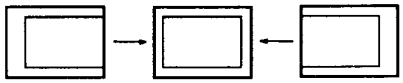
CIRCUIT ADJUSTMENTS

4-1. A BOARD ADJUSTMENTS

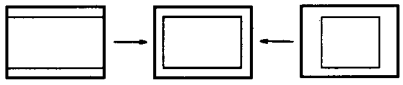


A-BOARD
– Component side –

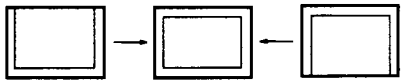
RV504 H.CENT (HORIZONTAL CENTER)



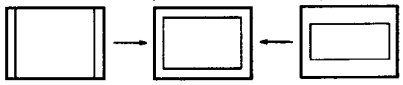
RV801 H.SIZE (HORIZONTAL SIZE)



RV501 V.CENT (VERTICAL CENTER)



RV505 V.SIZE (VERTICAL SIZE)



REF OSC 7.16 MHz Adjustment (CT 331)

1. Input an NTSC COLOR BAR pattern.
2. Short circuit between pin (17) of IC 331 and ground.
3. Adjust CT 331 to obtain color synchronization.
4. Remove the jumper wire from IC 331.

H.FREQ Adjustment (RV502)

1. Input a PAL COLOR BAR signal, then connect an electrolytic capacitor (100μ/16 V) between pin (28) and GND of IC502.
2. Adjust RV502 (H.FREQ) to stop scrolling of the picture in the horizontal direction.
3. After adjustment, remove the electrolytic capacitor.

f0: too low | f0: suitable | f0: too high

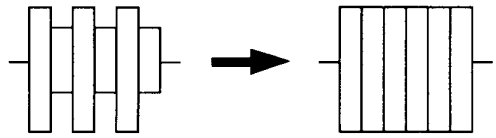
f0: 15.625±50Hz

REF OSC 8.8 MHz Adjustment (CT332)

1. Input a PAL COLOR BAR pattern.
2. Short circuit between pin (17) of IC331 and ground.
3. Adjust CT332 to obtain color synchronization.
4. Remove the jumper wire from IC331.

BELL FILTER Adjustment (LV301)

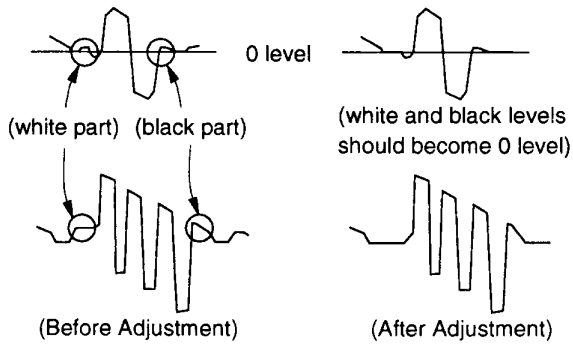
1. Input a SECAM COLOR BAR pattern.
2. Connect an oscilloscope to the Q303 emitter.
3. Adjust LV301 so that waveform becomes flat.



Before Adjustment | After Adjustment

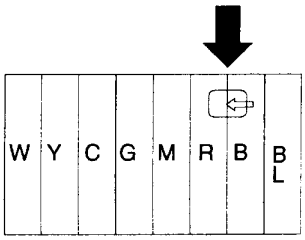
SECAM DISCRI Adjustment (RV331 R-Y L331 B-Y)

1. Input a SECAM COLOR BAR pattern.
2. Connect an oscilloscope to pin (1) of IC331.
3. Adjust RV331 (R-Y) so that white and black parts of the waveform of pin (1) becomes 0 level.
4. Connect an oscilloscope to pin (3) of IC331.
5. Adjust L331 (B-Y) so that white and black parts of the waveform of pin (3) becomes 0 level.

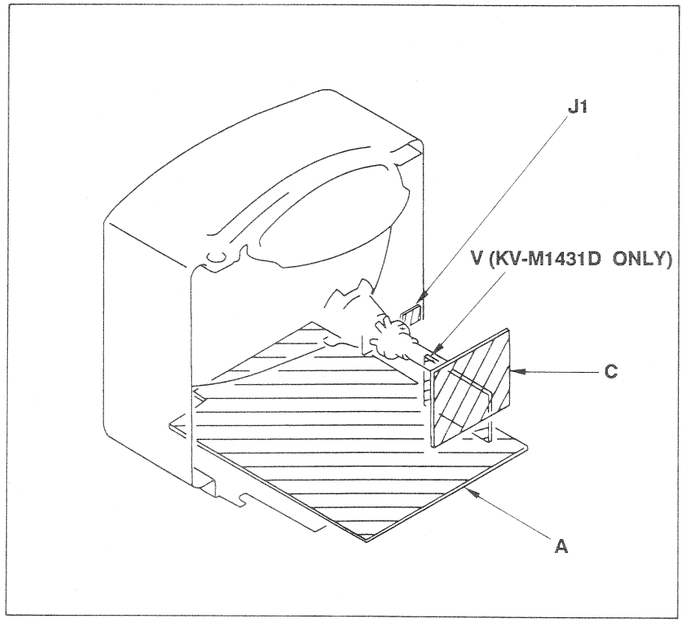


CHARACTER POSITION Adjustment [RV001]

1. Input a PAL COLOR BAR pattern.
2. Adjust RV001 to position the character display at the point indicated by the arrow below.



5-1. CIRCUIT BOARDS LOCATION



5-2. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
  kΩ =1000Ω , MΩ =1000KΩ
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch: 5 mm
Rating electrical power ¼ W

- : nonflammable resistor.
- △ : internal component.
- ▭ : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth-ground.
- ⏚ : earth-chassis.
- ⧺ : no mounted.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

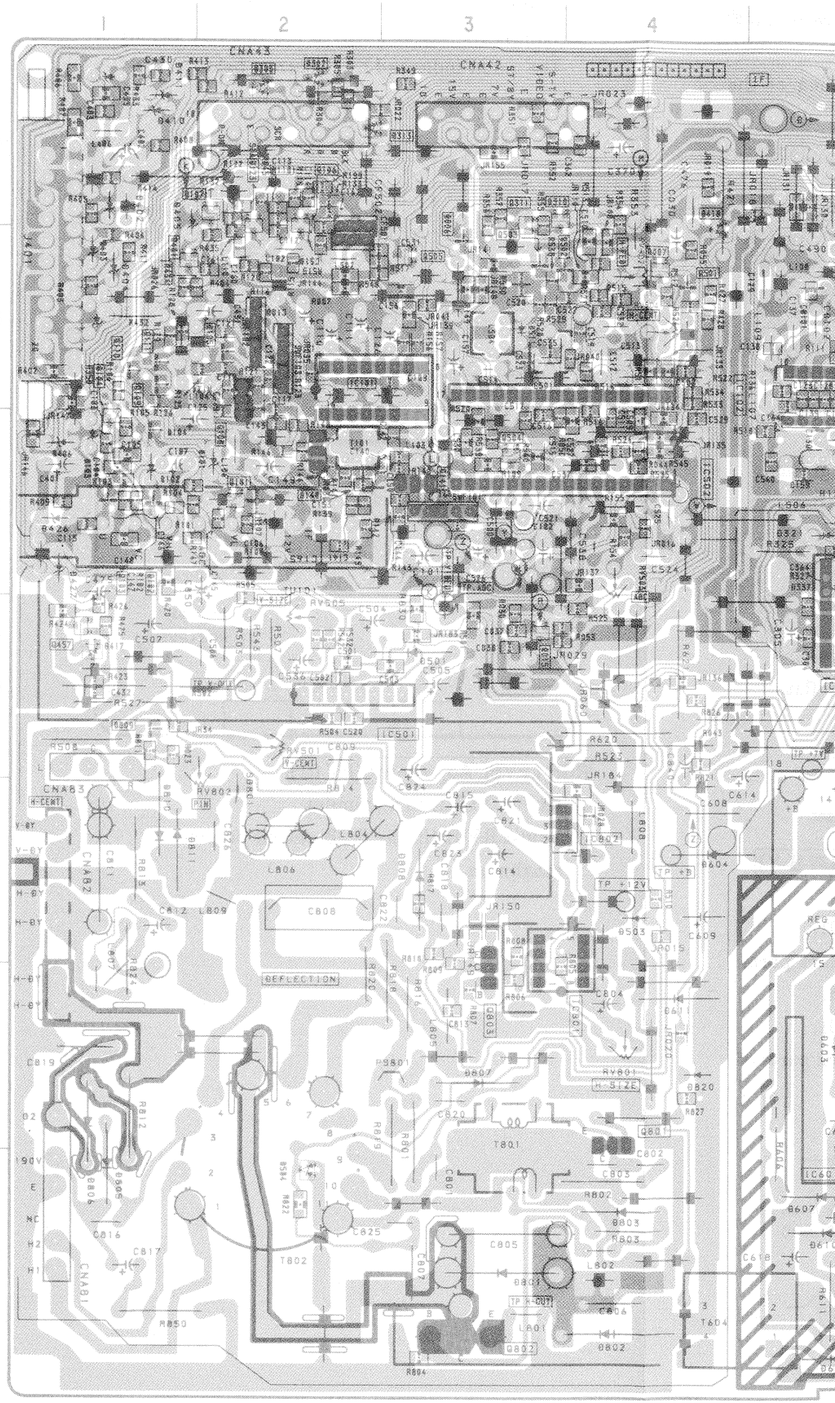
Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a color-bar signal input.
- Readings are taken with a 10MΩ digital multimeter.
- Voltage are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- ▬ : B+ bus.
- ▒ : signal path. (RF)

– A Board –

DIODE		DIODE		TRANSISTOR	
D002	E-10	D1301	B-10	Q305	B-6
D004	C-9	D1302	B-10	Q307	B-6
D007	B-8	D1303	B-10	Q310	A-3
D008	D-10	D1304	A-10	Q311	A-3
D009	B-8	D1305	A-10	Q401	B-1
D011	E-8	D1306	B-10	Q457	D-1
D020	B-8	D1307	B-10	Q504	C-3
D110	C-5			Q505	B-3
D301	C-6	IC		Q601	G-5
D302	A-2			Q801	F-4
D303	B-6	IC001	C-9	Q802	H-3
D305	A-2	IC002	D-9	Q803	F-3
D306	B-6	IC003	D-10	Q1301	B-9
D313	A-3	IC004	E-9	Q1302	B-10
D321	C-5	IC005	B-8	Q1303	B-10
D324	A-7	IC102	B-5	Q1304	A-10
D334	B-6	IC201	F-8	Q1305	A-10
D402	A-1	IC301	D-5	Q1306	B-10
D403	B-1	IC302	B-7		
D404	B-1	IC331	C-7	VARIABLE RESISTOR	
D405	A-1	IC501	D-2		
D406	C-1	IC502	C-4	RV001	D-9
D411	A-1	IC601	G-5	RV501	D-2
D417	D-1	IC801	F-3	RV502	B-4
D418	A-4	IC802	E-4	RV503	C-4
D426	C-1			RV504	B-4
D427	C-1			RV505	D-2
D450	B-5			RV801	F-4
D501	D-3	TRANSISTOR			
D503	E-4			TRIMMER	
D504	G-2	Q001	D-8		
D519	C-8	Q003	C-9	CT332	C-7
D601	F-7	Q004	D-10		
D602	F-6	Q005	B-8		
D603	F-5	Q006	C-8		
D604	E-4	Q007	B-4		
D605	E-6	Q015	D-3		
D606	D-5	Q016	D-10		
D607	G-5	Q017	E-9		
D608	H-5	Q019	D-10		
D609	G-5	Q020	D-8		
D610	G-5	Q104	C-1		
D611	F-4	Q106	A-2		
D801	G-3	Q107	A-2		
D802	H-4	Q112	A-7		
D803	G-4	Q114	B-5		
D805	G-1	Q115	A-6		
D806	F-1	Q123	A-2		
D807	F-3	Q141	C-3		
D808	E-3	Q302	C-7		
D810	E-1	Q304	B-6		
D811	E-1				
D820	F-4				



XIDE

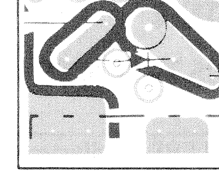
IND

NE

se noted.
production

– A Board –

A [SYSTEM CONTROL, A/V OUT, H/V OUT, MEMORY, CHROMA]



The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

DIODE	
D002	E-10
D004	C-9
D007	B-8
D008	D-10
D009	B-8
D011	E-8
D020	B-8
D110	C-5
D301	C-6
D302	A-2
D303	B-6
D305	A-2
D306	B-6
D313	A-3
D321	C-5
D324	A-7
D334	B-6
D402	A-1
D403	B-1
D404	B-1
D405	A-1
D406	C-1
D411	A-1
D417	D-1
D418	A-4
D426	C-1
D427	C-1
D450	B-5
D501	D-3
D503	E-4
D504	G-2
D519	C-8
D601	F-7
D602	F-6
D603	F-5
D604	E-4
D605	E-6
D606	D-5
D607	G-5
D608	H-5
D609	G-5
D610	G-5
D611	F-4
D801	G-3
D802	H-4
D803	G-4
D805	G-1
D806	F-1
D807	F-3
D808	E-3
D810	E-1
D811	E-1
D820	F-4

DIODE	
D1301	B-10
D1302	B-10
D1303	B-10
D1304	A-10
D1305	A-10
D1306	B-10
D1307	B-10

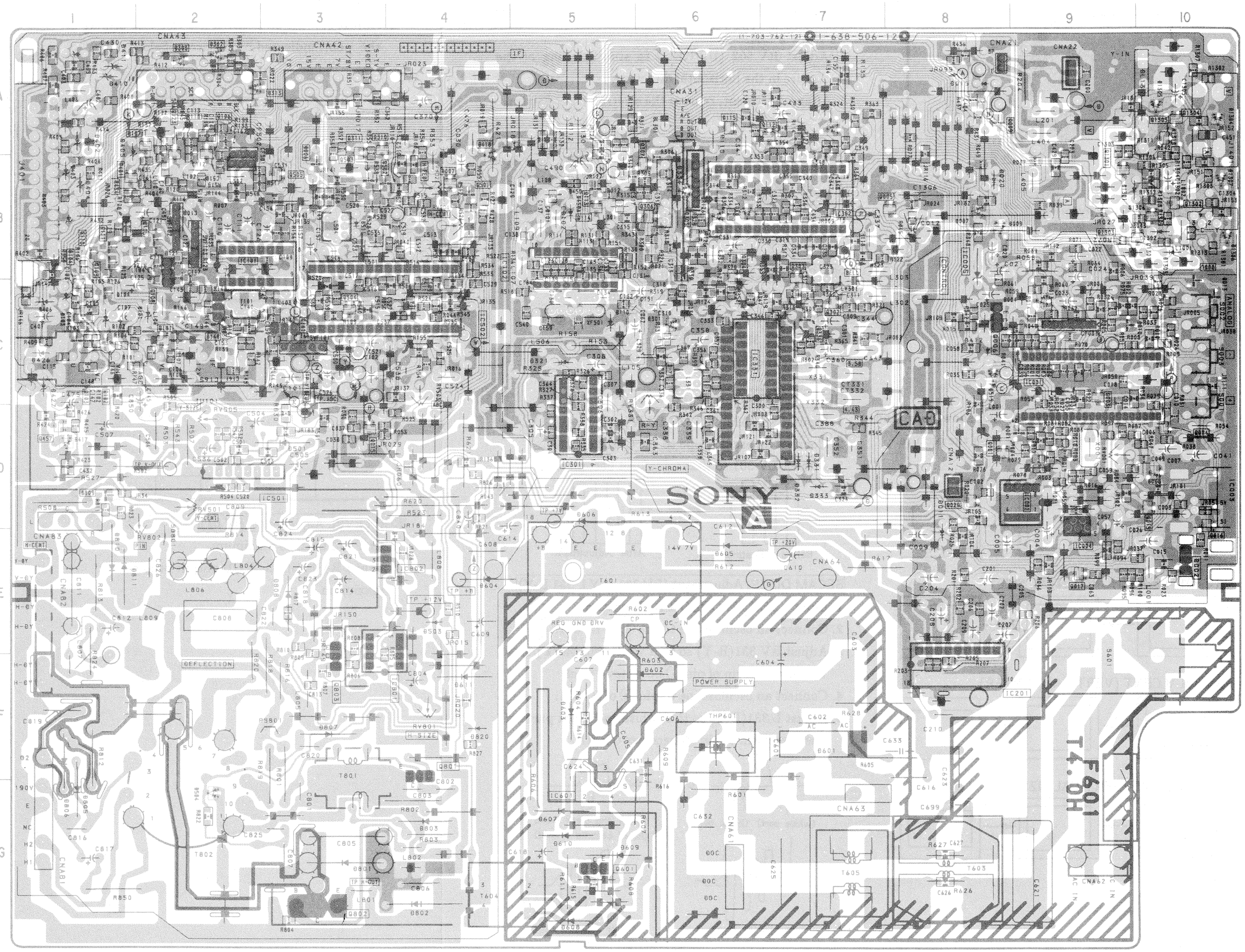
IC	
IC001	C-9
IC002	D-9
IC003	D-10
IC004	E-9
IC005	B-8
IC102	B-5
IC201	F-8
IC301	D-5
IC302	B-7
IC331	C-7
IC501	D-2
IC502	C-4
IC601	G-5
IC801	F-3
IC802	E-4

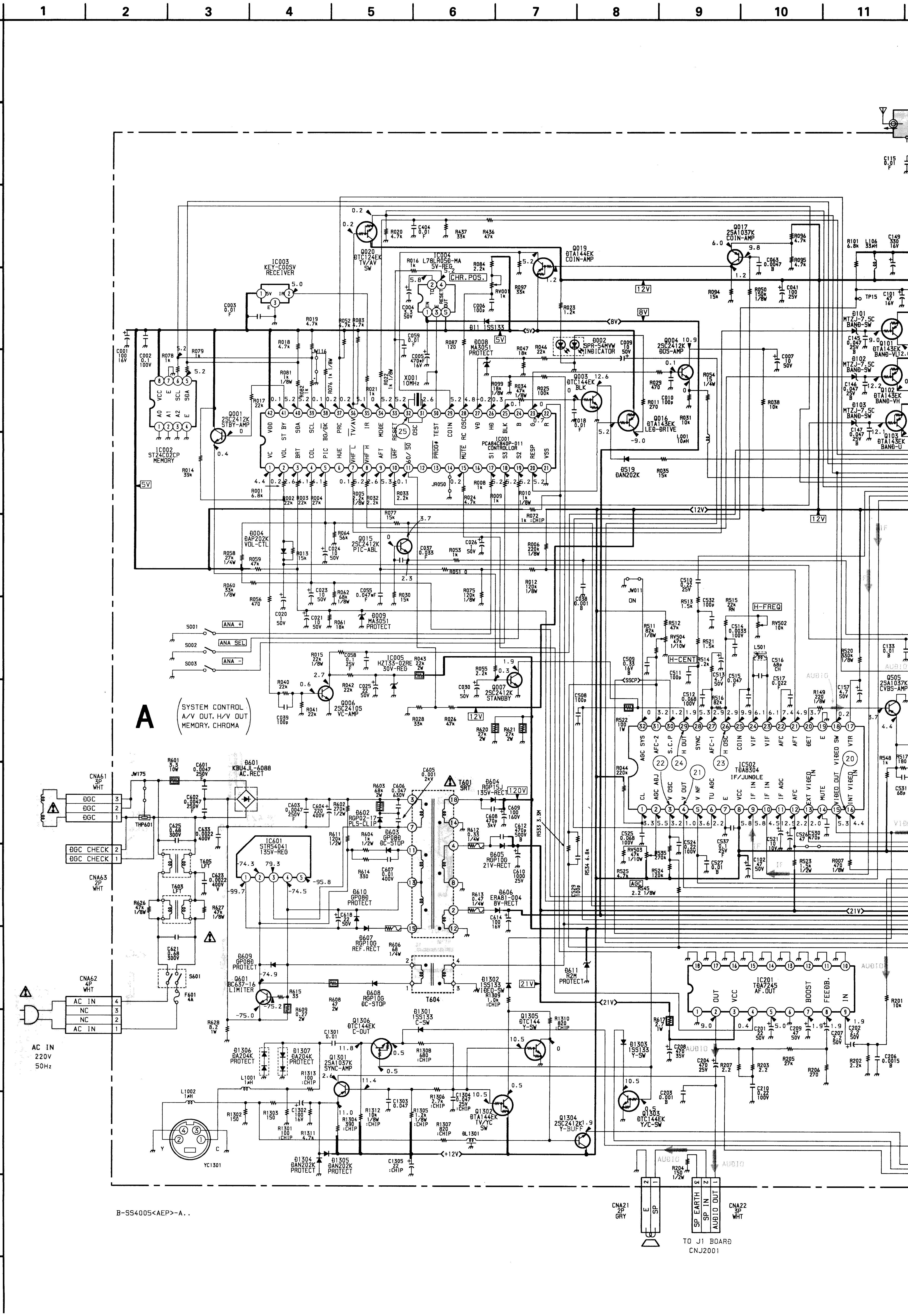
TRANSISTOR	
Q001	D-8
Q003	C-9
Q004	D-10
Q005	B-8
Q006	C-8
Q007	B-4
Q015	D-3
Q016	D-10
Q017	E-9
Q019	D-10
Q020	D-8
Q104	C-1
Q106	A-2
Q107	A-2
Q112	A-7
Q114	B-5
Q115	A-6
Q123	A-2
Q141	C-3
Q302	C-7
Q304	B-6

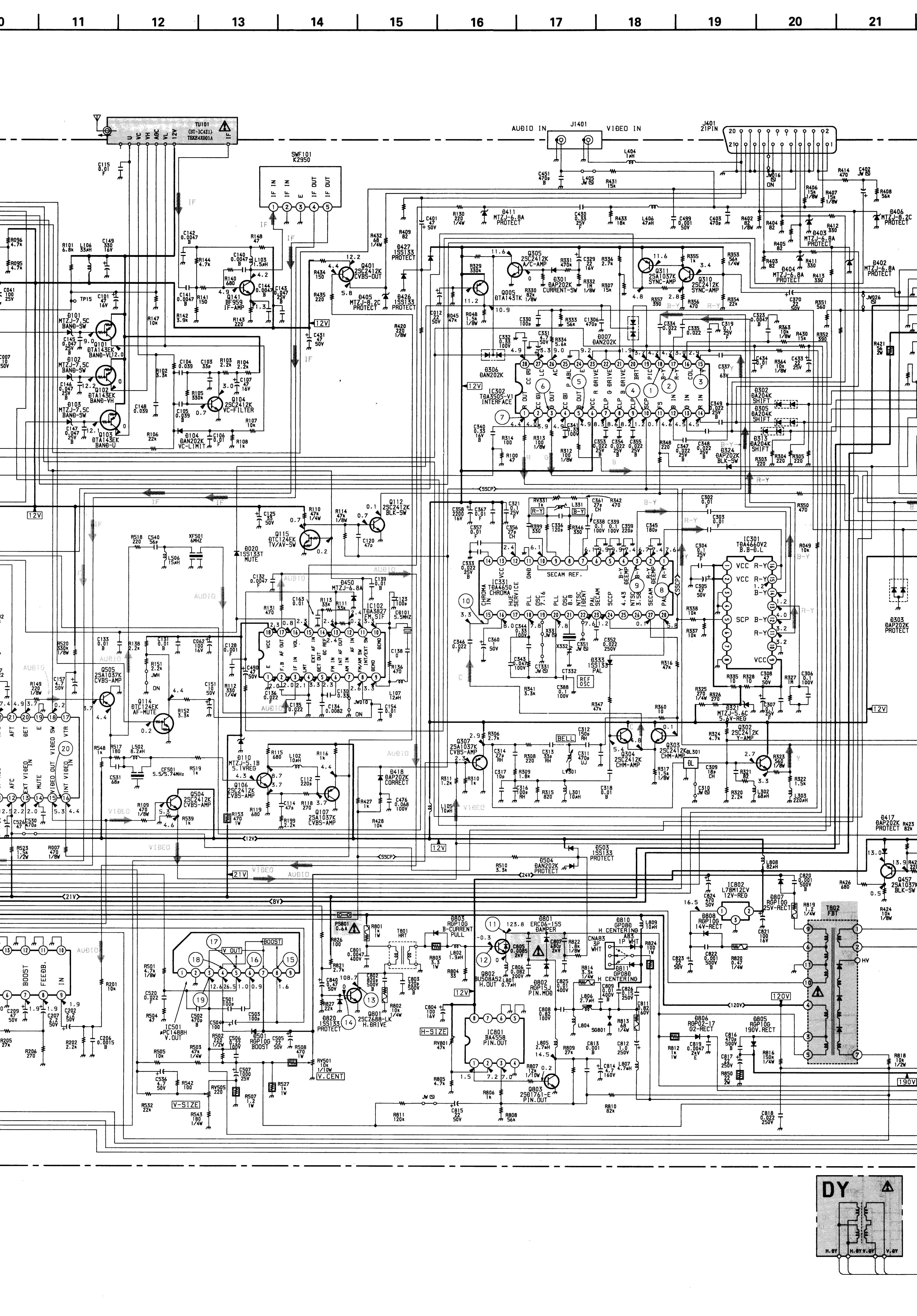
TRANSISTOR	
Q305	B-6
Q307	B-6
Q310	A-3
Q311	A-3
Q401	B-1
Q457	D-1
Q504	C-3
Q505	B-3
Q601	G-5
Q801	F-4
Q802	H-3
Q803	F-3
Q1301	B-9
Q1302	B-10
Q1303	B-10
Q1304	A-10
Q1305	A-10
Q1306	B-10

VARIABLE RESISTOR	
RV001	D-9
RV501	D-2
RV502	B-4
RV503	C-4
RV504	B-4
RV505	D-2
RV801	F-4

TRIMMER	
CT332	C-7

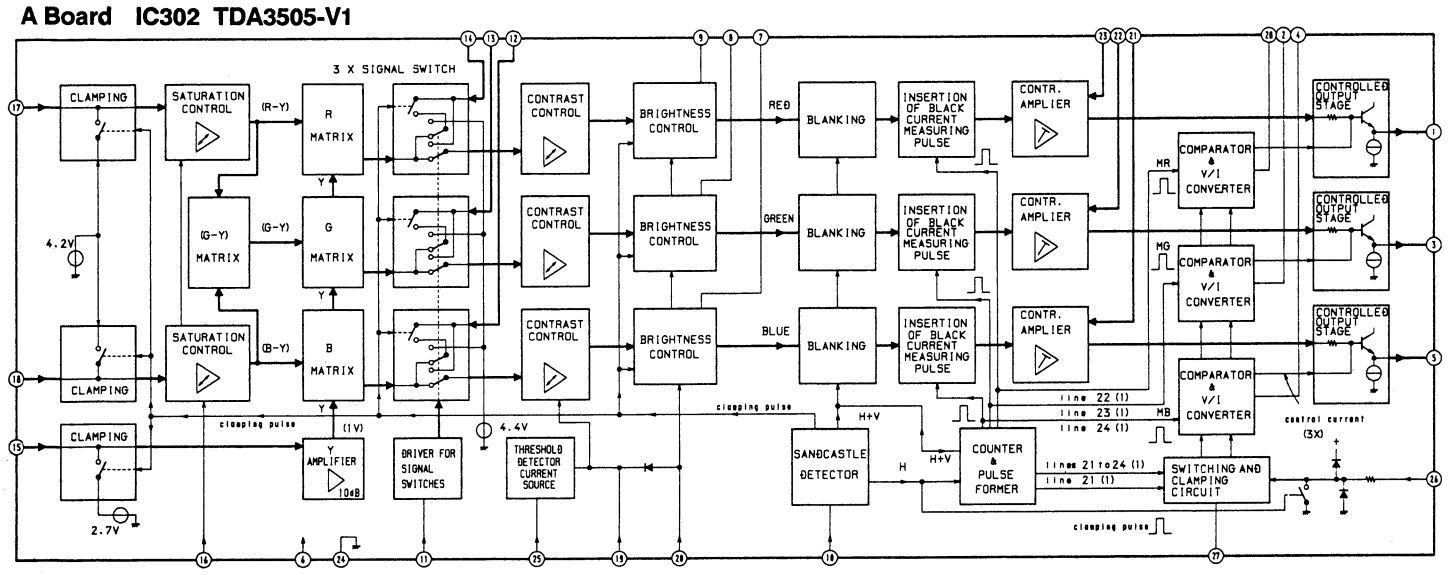



A
SYSTEM CONTROL
A/V OUT, H/V OUT
MEMORY, CHROMA
IC001 PCA84C840P-011 CONTROLLOR
IC002 ST24C02CP MEMORY
IC003 KEY-C005V RECEIVER
IC004 L78LR05D-MA 5V-REG
IC005 HZT33-02RE 30V-REG
IC502 TDA8304 IF/JUNGLE
IC601 STR54041 135V-REG
IC201 TDA7245 AF.OUT
T601 SRT
T604
D601 KBU4JL-6088 AC.RECT
D002 SPR-54MVW INDICATOR
CHR.POS.
H-FREQ
H-CENT
S001 ANA +
S002 ANA SEL
S003 ANA -
CNA61 3P WHT
DGC CHECK
CNA63 2P WHT
CNA62 4P WHT
AC IN
NC
NC
AC IN
AC IN 220V 50Hz
YC1301
CNA21 2P GRY
E
SP
CNA22 3P WHT
SP EARTH
SP IN
AUDIO OUT
TO J1 BOARD CNJ2001
B-SS4005<AEP>-A..

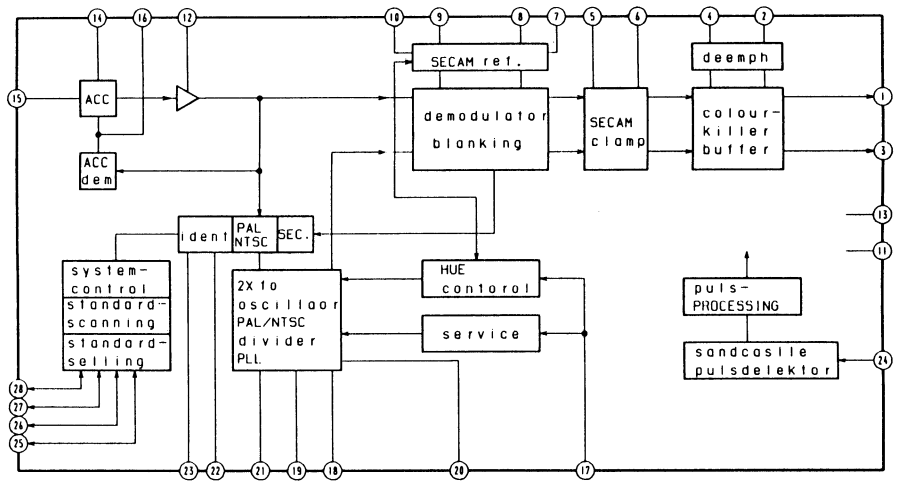


11 12 13 14 15 16 17 18 19 20 21
TU101 (BT-3C421) TEKE4X001A
SWF101 K2950
AUDIO IN J1401 VIDEO IN
J401 21PIN
Q141 BF959 IF-AMP
Q401 2SC2412K CVBS-OUT
Q305 2SC2412K A/C-AMP
Q311 2SA1037K SYNC-AMP
Q310 2SC2412K SYNC-AMP
IC302 TDA3505-V1 INTERFACE
Q101 DTA143EK BAND-VL
Q102 DTA143EK BAND-VH
Q103 DTA143EK BAND-U
Q104 2SC2412K VC-FILTER
Q112 2SC2412K BLK-SW
Q115 DTC124EK TV/AV-SW
IC102 TDA3827 FM.SIF
IC331 TDA4650 CHROMA
IC301 TDA4660V2 B.B-D.L
SECAM REF.
Q505 2SA1037K CVBS-AMP
Q114 DTC124EK AF-MUTE
Q504 2SC2412K CVBS-AMP
Q106 2SC2412K CVBS-AMP
Q107 2SA1037K CVBS-AMP
Q307 2SA1037K CVBS-AMP
Q304 2SC2412K CHM-AMP
Q303 2SC2412K CHM-AMP
Q302 2SC2412K Y-AMP
Q457 2SA1037K BLK-SW
IC802 L78M12CV 12V-REG
IC501 μPC1488H V.OUT
IC801 BA4558 PIN.OUT
Q802 BU508AS2 H.OUT
Q801 2SC2688-LK H.DRIVE
Q803 2SD1761-E PIN.OUT
T801 HRT
T802 FBT
V-SIZE
H-SIZE
V.CENT
DY
H.DY H.DY V.DY V.DY

A Board IC302 TDA3505-V1



A Board IC331 TDA4650



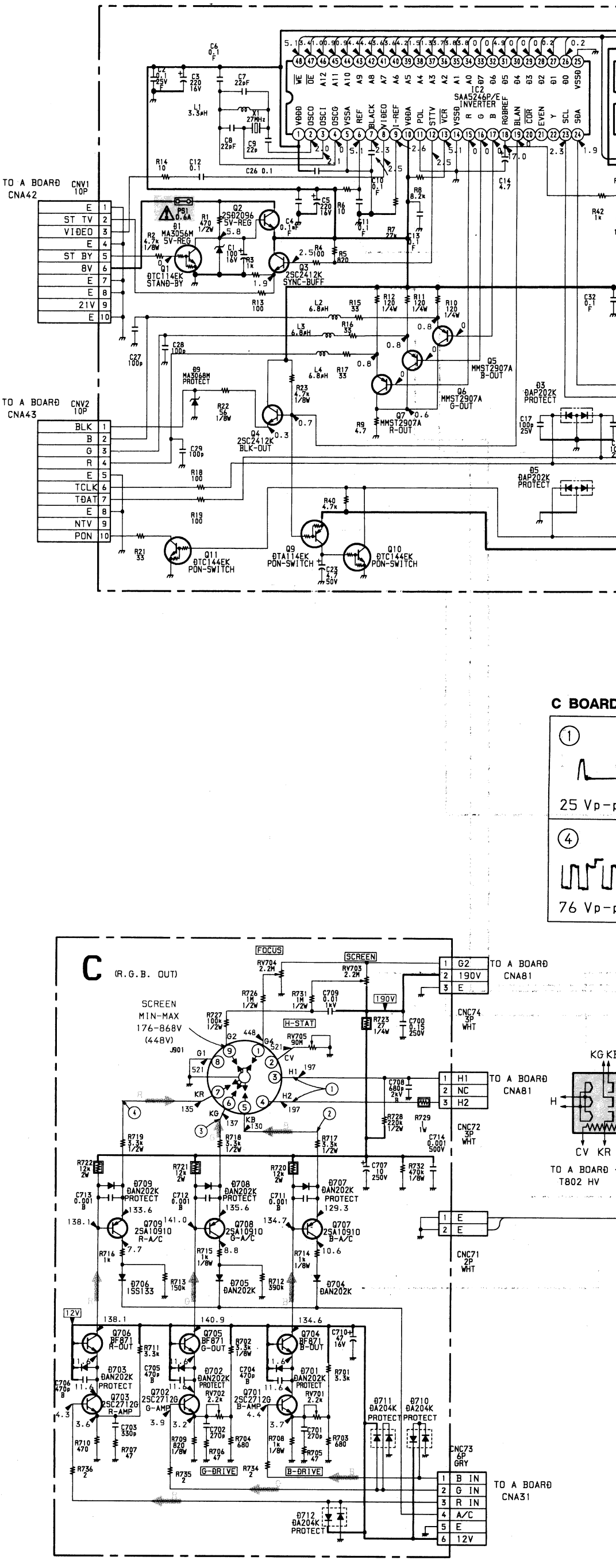
A BOARD WAVEFORMS

① 1.5Vp-p (H)	② 1.2Vp-p (H)	③ 0.38Vp-p (H)
④ 7.5Vp-p (H)	⑤ 2.4 Vp-p (H)	⑥ 2.5 Vp-p(H)
⑦ 2.5Vp-p (H)	⑧ 0.6Vp-p (H)	⑨ 0.6 Vp-p (H)
⑩ 0.24Vp-p (H)	⑪ 750Vp-p (H)	⑫ 12 Vp-p (H)
⑬ 250Vp-p (H)	⑭ 3.4Vp-p (H)	⑮ 2.0Vp-p (V)
⑯ 2.5Vp-p (V)	⑰ 1.5Vp-p (V)	⑱ 2.2Vp-p (V)

B-¥SS4002<UK.>-A<WAVELIST>-1

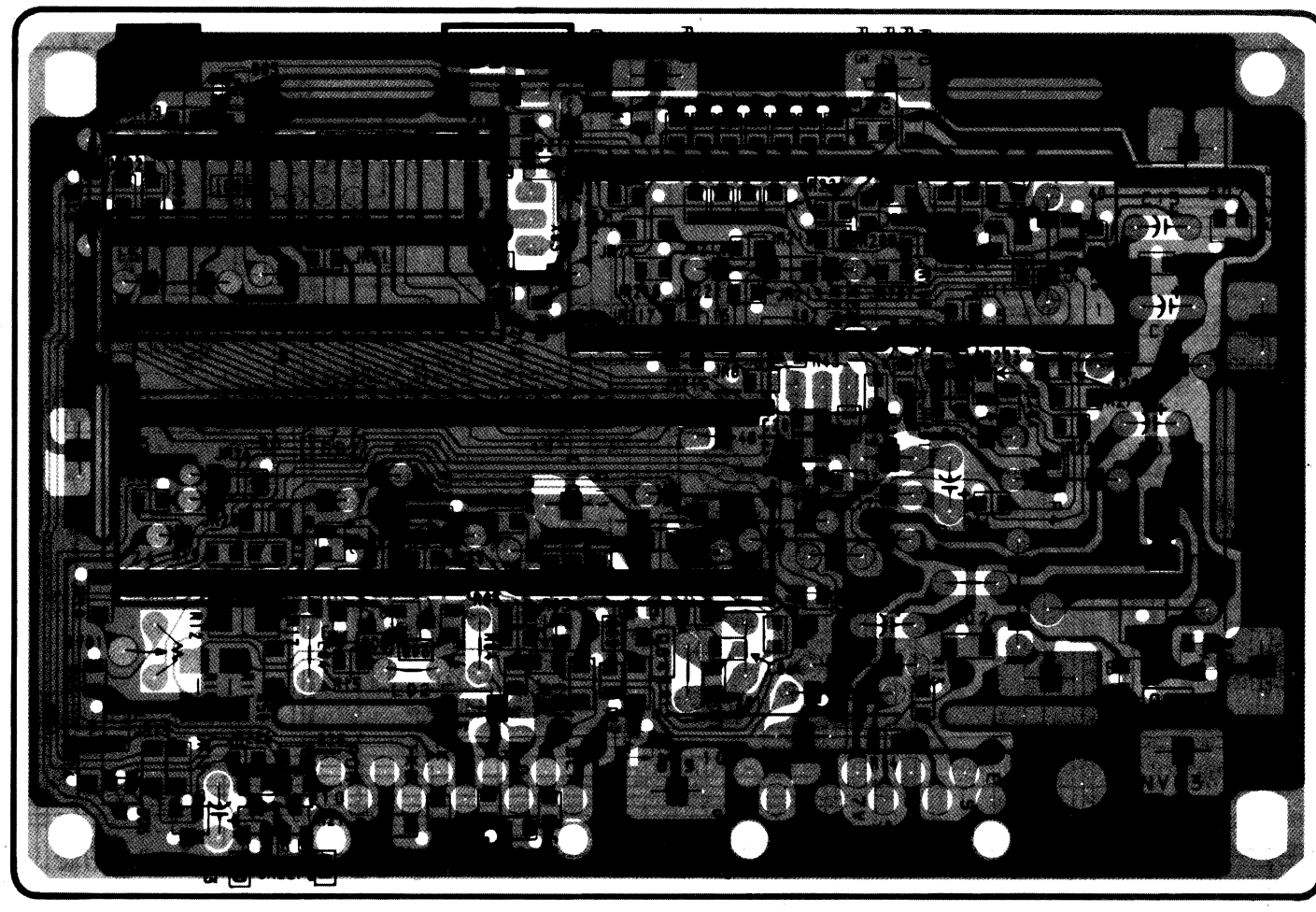
⑲ 50Vp-p (V)	⑳ 1.7Vp-p (H)	㉑ 5.2 Vp-p (V)
㉒ 2.0Vp-p (V)	㉓ 1.8 Vp-p (H)	㉔ 2.8 Vp-p(H)
㉕ 1.7Vp-p (10MHz)	㉖ 200Vp-p(H)	㉗ 4.2 Vp-p (V)

B-¥SS4002<UK.>-A<WAVELIST>-2

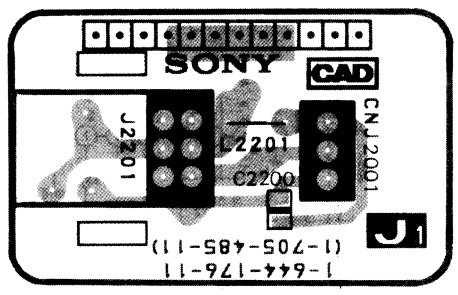

TO A BOARD CNA42
CNV1 10P
E 1
ST TV 2
VIDEO 3
E 4
ST BY 5
8V 6
E 7
E 8
21V 9
E 10
TO A BOARD CNA43
CNV2 10P
BLK 1
B 2
G 3
R 4
E 5
TCLK 6
TDAT 7
E 8
NTV 9
PON 10
IC2
SAA5246P/E
INVERTER
Q1 DTC114EK STAND-BY
Q2 2SD2096 5V-REG
Q3 2SC2412K SYNC-BUFF
Q4 2SC2412K BLK-OUT
Q5 MMST2907A B-OUT
Q6 MMST2907A G-OUT
Q7 MMST2907A R-OUT
Q9 DTA114EK PON-SWITCH
Q10 DTC144EK PON-SWITCH
Q11 DTC144EK PON-SWITCH
D1 MA3056M 5V-REG
D3 DAP202K PROTECT
D5 DAP202K PROTECT
D9 MA3068M PROTECT
X1 27MHz
C BOARD
25 Vp-p
76 Vp-p
C (R.G.B. OUT)
SCREEN MIN-MAX 176-868V (448V)
J901
FOCUS
SCREEN
H-STAT
190V
12V
TO A BOARD CNA81
CNC74 3P WHT
CNC72 3P WHT
CNC71 2P WHT
TO A BOARD T802 HV
TO A BOARD CNA31
CNC73 6P GRY
1 G2
2 190V
3 E
1 H1
2 NC
3 H2
1 E
2 E
1 B IN
2 G IN
3 R IN
4 A/C
5 E
6 12V
KG KB
H
CV KR
Q701 2SC2712G B-AMP
Q702 2SC2712G G-AMP
Q703 2SC2712G R-AMP
Q704 BF871 B-OUT
Q705 BF871 G-OUT
Q706 BF871 R-OUT
Q707 2SA10910 B-A/C
Q708 2SA10910 G-A/C
Q709 2SA10910 R-A/C
D701 DAN202K PROTECT
D702 DAN202K PROTECT
D703 DAN202K PROTECT
D704 DAN202K
D705 DAN202K
D706 1SS133
D707 DAN202K PROTECT
D708 DAN202K PROTECT
D709 DAN202K PROTECT
D710 DA204K PROTECT
D711 DA204K PROTECT
D712 DA204K PROTECT

V [TEXT] **C** [R, G, B OUT] **J1** [JACK]

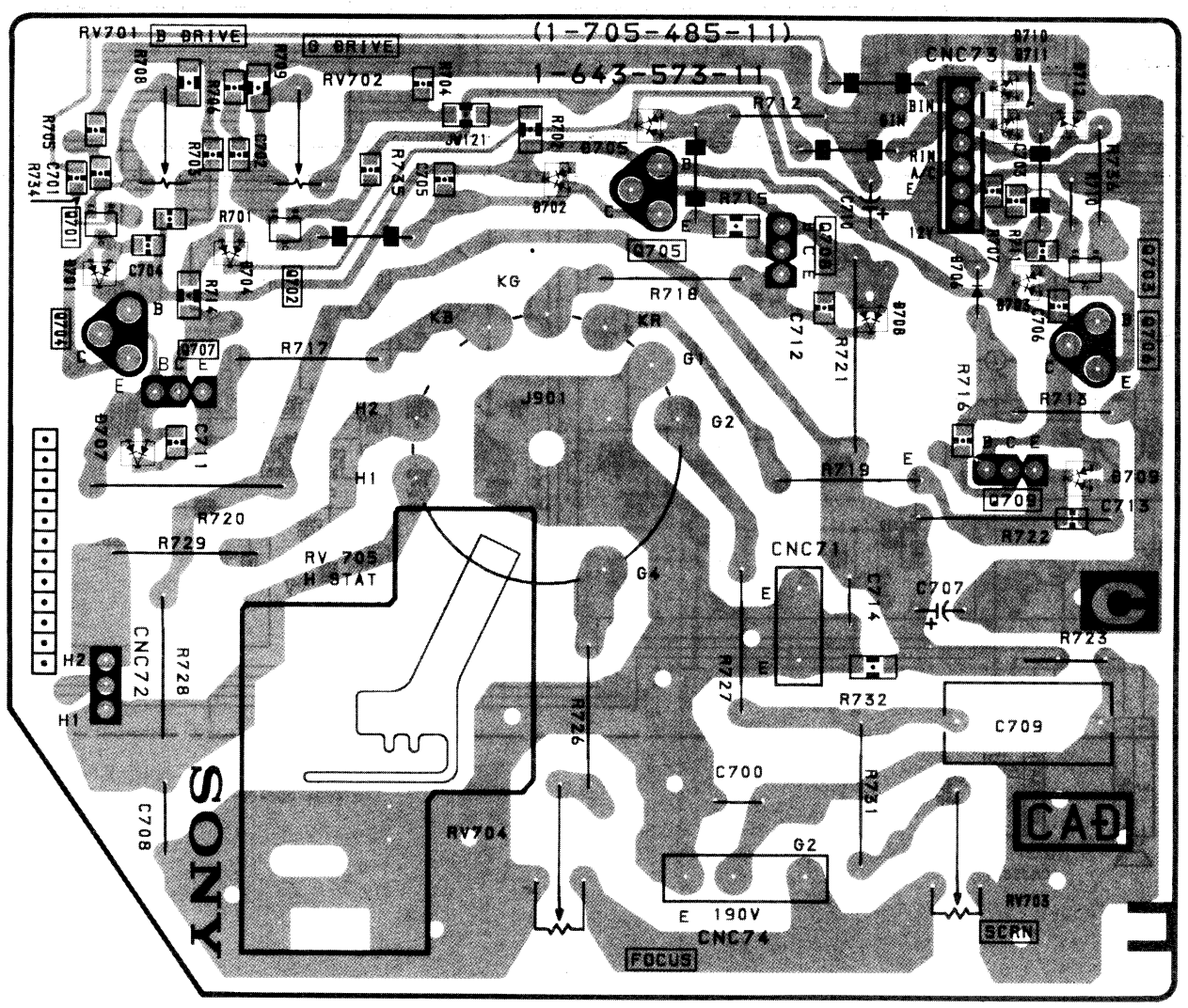
– V Board –

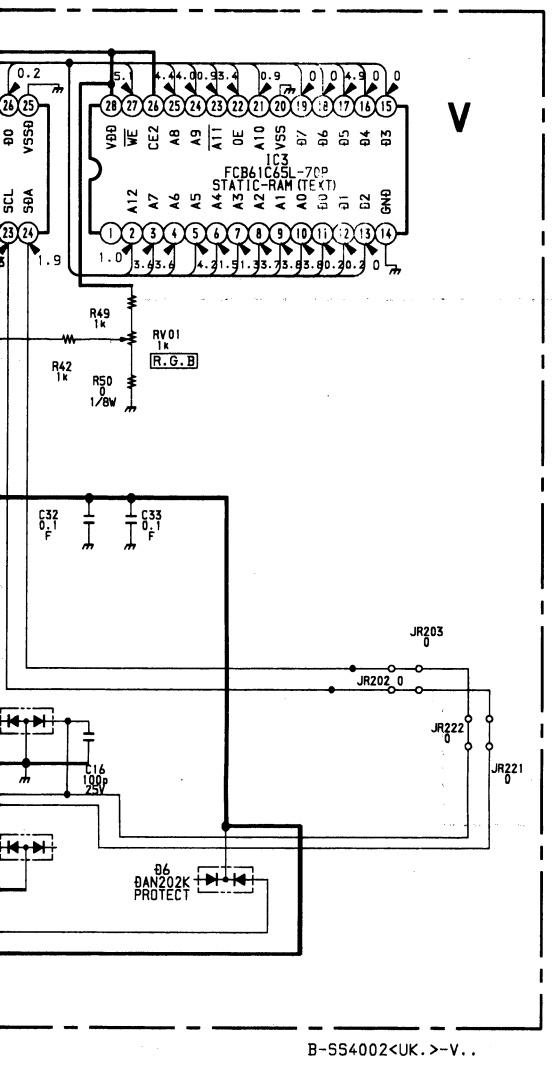


– J1 Board –



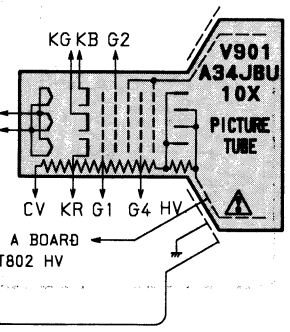
– C Board –

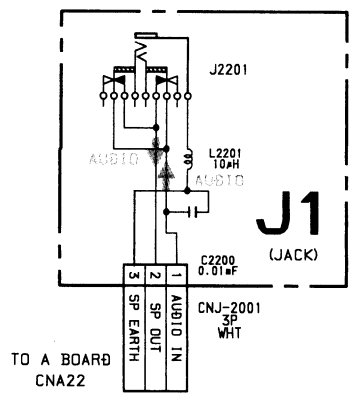




BOARD WAVEFORMS

① 25 Vp-p (H)	② 68 Vp-p (H)	③ 70 Vp-p (H)
④ 76 Vp-p (H)		

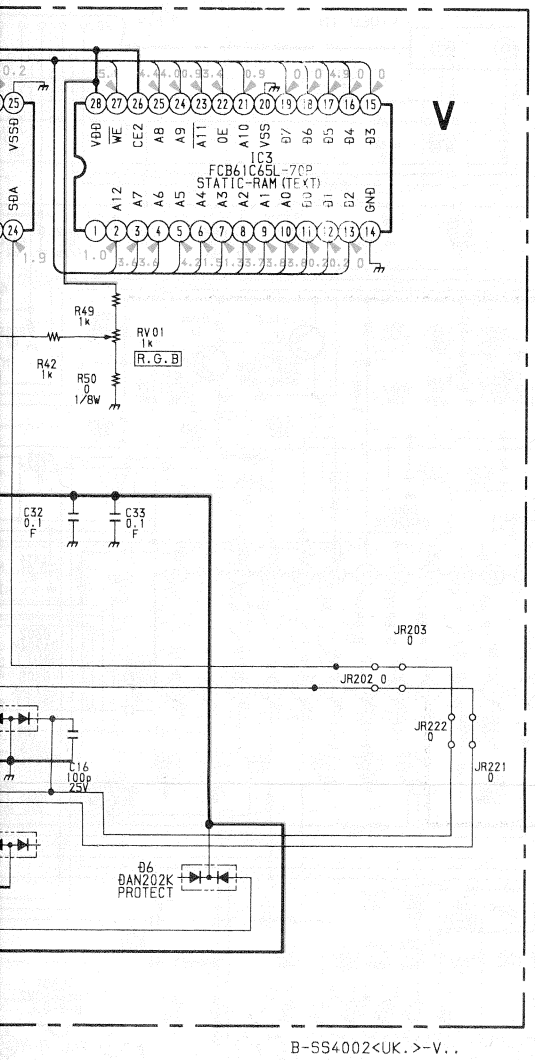




B-SS4002<UK.>-J1.

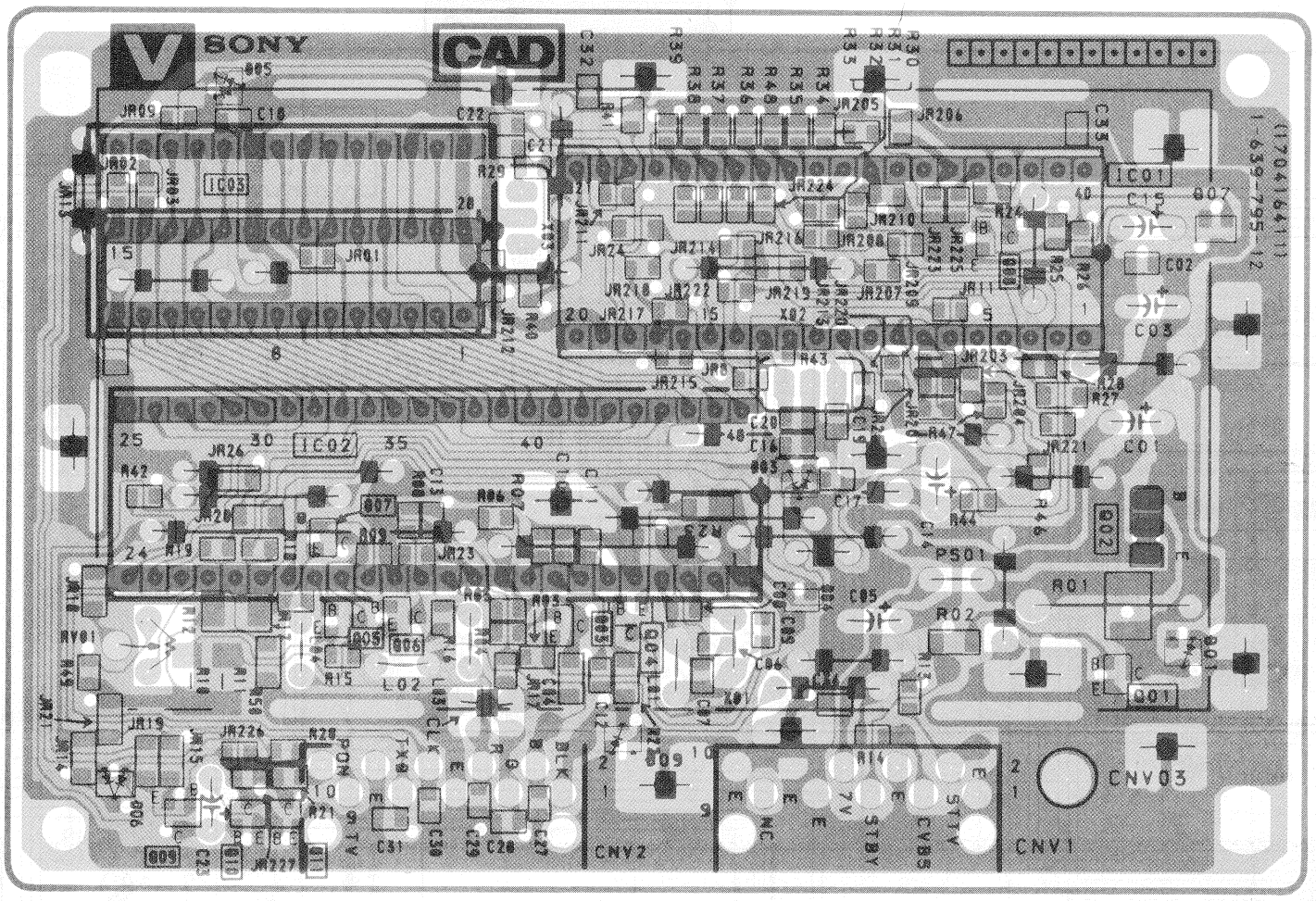
-C..

V [TEXT] C [R, G, B OUT] J1 [JACK]

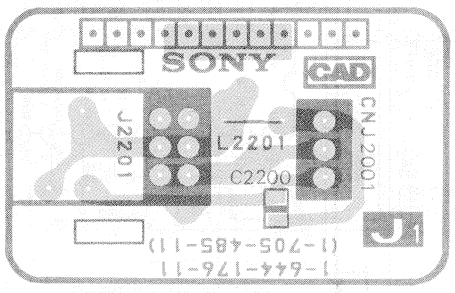


B-SS4002<UK.>-V..

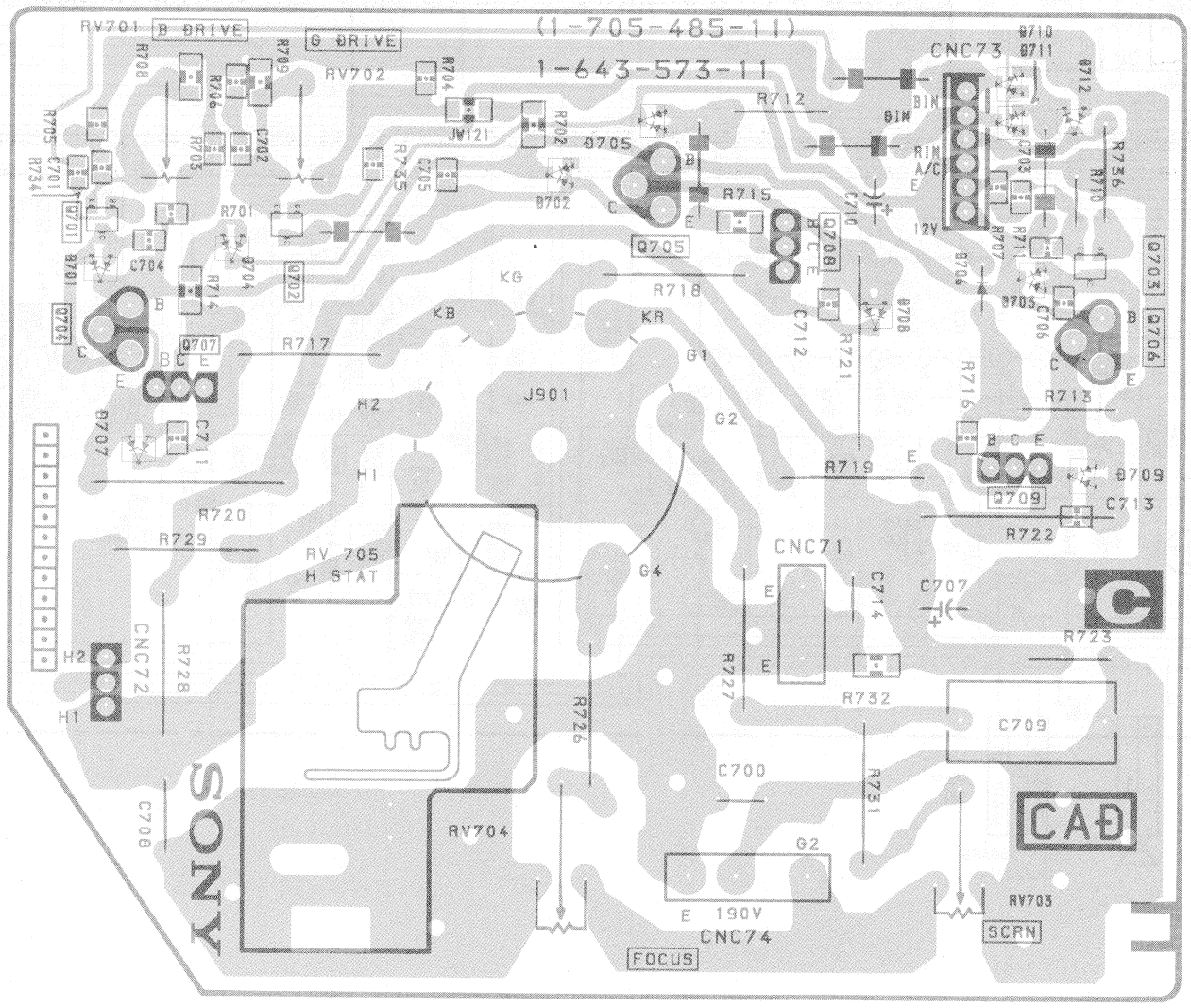
– V Board –



– J1 Board –

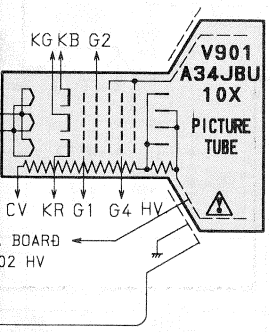


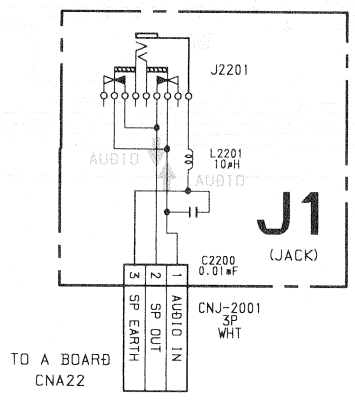
– C Board –



BOARD WAVEFORMS

① 5 Vp-p (H)	② 68 Vp-p (H)	③ 70 Vp-p (H)
④ 6 Vp-p (H)		

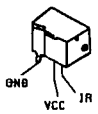




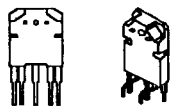
B-SS4002<UK.>-J1.

5-3. SEMICONDUCTORS

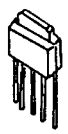
KEY-C00SV-F



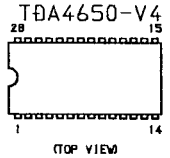
STR54041



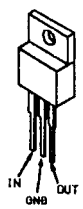
L78LR05Đ-MA



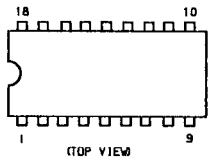
TĐA3505-V1
FCB61C65-70P
TĐA4650-V4



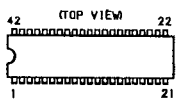
M5F78M12L



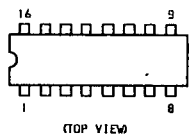
TĐA3827-V3
TĐA7245



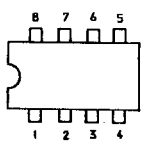
PCA84C840P-011



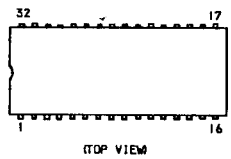
TĐA4660V2



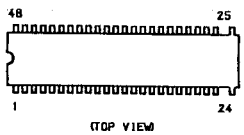
RC4558P
ST24C02CP



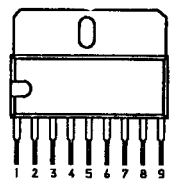
TĐA8304



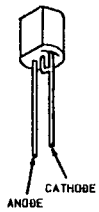
SAA5246P/E



μPC1488H



μPC574J



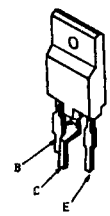
BC637-16

BF421
2SA1091-0

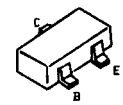
BF871

BF959

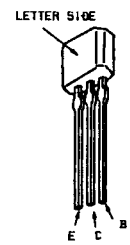
BU508AS2



ĐTA114EK
ĐTA143EK
ĐTA143TK
ĐTA144EK
ĐTC114EK
ĐTC124EK
ĐTC144EK
MMST2907A
2SA1037K
2SA1162G
2SB1295-UL6
2SC1623-L5L6
2SC1623-L5L6
2SC2412K
2SC2712YG



2SC2410SN



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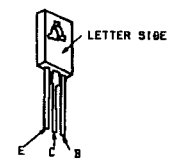
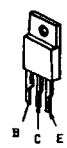
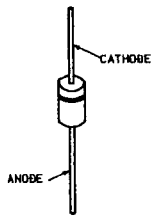


2SĐ1408-Y

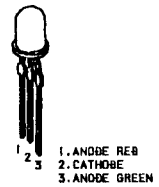


2SD2096-EF

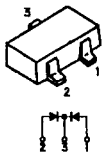
ERC06-15S
R2M



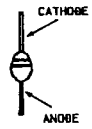
SPR-54MVW



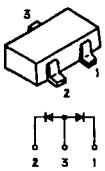
DAN202K
MA152WK



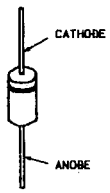
GP08D
U05G



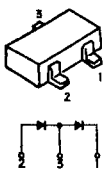
DAP202K



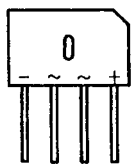
RGP02-17
RGP10G
RU-3AM



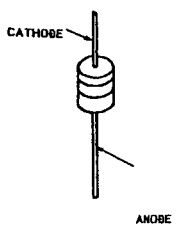
DA204K
1SS226



KBU4JL-6088
RBV-406H-01



ERA83-006
RD5.1ES-B2
RD5.6ES-B2
RD6.8ES-B2
RD8.2ES-B3
1SS119
1SS133



MA3051
MA3056M
MA3068M
RD5.1M-B2
RD5.6M-B2
RD6.8M-B2